

West Germany Seizes VAX Believed En Route to USSR

By Peter Bartolik
CW Staff

A top-of-the-line Digital Equipment Corp. superminicomputer allegedly en route to the Soviet Union was seized by West German authorities just minutes before it was scheduled to leave their jurisdiction, U.S. authorities reported last week.

The seizure comes during bitter debate in the U.S. over renewing export regulations.

According to officials of the U.S. Treasury Department and the U.S. Customs Service, West German au-



thorities waiting at dockside in Hamburg received court authorization to seize the VAX-11/782 from a Swedish cargo ship just seven minutes before it left for Sweden on Friday, Nov. 11. The ship was slated to travel on to the Soviet Union, where the computer allegedly would have been delivered.

Customs agents stationed overseas reportedly learned the equipment was destined for the Soviet Union and initiated the seizure procedures. One West German court refused to issue the seizure order but was overturned by a higher court, the U.S. officials said.

The DEC superminicomputer, which is embargoed by the U.S. government from shipment to communist countries, was reportedly purchased by an unidentified firm

in New York for shipment to an affiliate company in South Africa; at some point it was diverted to Hamburg, West Germany. Officials could not say whether the computer was ever delivered in South Africa or whether it was diverted during shipment from the U.S.

According to a U.S. Customs spokeswoman, the VAX-11/782, composed of dual VAX-11/780s, was equipped with 4M bytes of memory and was valued at \$1.5 million to \$2 million.

John M. Walker Jr., assistant secretary of the treasury for enforcement and operations, said the unit can be used for military applications. He also said it was unclear whether the

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COMPUTERWORLD

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Inside

IBM wants up to \$2.5 billion in damages from National Semiconductor Corp. and National Advanced Systems, Inc. for allegedly helping Hitachi Ltd. to steal IBM trade secrets. Page 2.

Rolm Corp. unveiled a successor to its CBX telephone and data switching line — a high-speed digital communications system that can support up to 10,000 voice and data users. Mohawk Data Sciences Corp. was also active last week; it introduced workstations and communications processors for IBM 3270 sites. Page 4.

Data General Corp. positioned itself several bytes above the rest of the crowd by becoming the first vendor to use the 256K-byte memory chip in a commercially available processor. Page 5.

Charges have been dropped against Magnuson Computer Systems, Inc. co-founder Paul Magnuson and two associates, accused of computer crime and trade-secrets theft. Page 8.

The Reagan administration has failed to enforce privacy laws, the House Government Operations Committee charges in a recently issued report. Page 15.

DP professionals are not nec-

essarily for sale to the highest bidder. Many will take a cut in pay in return for a position promising professional growth, according to two surveys. Page 18.

Users of small computer systems are less than pleased with the support they receive from computer vendors, especially in the area of software, according to a study just released by Input, Inc. Page 83.

Doling out dollars for employee ideas is not a new practice among computer firms, but it can be quite lucrative for both the employer and for the worker who trades his brainstorms for bucks. Page 101.

DEC Unveils New Design In Successor To VT100

By Jim Bartimo
CW Staff

BOSTON — Digital Equipment Corp. last week introduced a new line of CRT terminals that it said costs less than its long-successful VT100 series, offers more features than its predecessor and sports a completely revamped design — including a detached keyboard.

Although the VT100s will remain in production for at least the next two years, the new terminals — the VT200s — are expected to replace them eventually. The VT200s are compatible with their VT100 predecessors which, with an installed base of about 500,000, have become an unofficial standard in communications.

DEC President Kenneth Olsen, who addressed the press conference here last week at which the VT200 line was announced, said his company has taken the same design approach it took with the VT100 series. "People wondered why we sold a terminal for more money than [our competition]," Olsen said. "But people appreciated the VT100, and [the extra functions] paid off in the long run."

The VT200 family includes three members: the VT220, the basic model; the VT240, which supports bit-mapped business graphics; and the VT241, which supports color graphics and text. All three emulate the VT100, but add reverse video, character highlighting and special function keys.

The keys on the 103-key keyboard are programmable. A total of 256

(Continued on Page 6)

Bell DP Shop Takes Controversial Route In Rush to Meet Divestiture Deadline

By Paul Gillin
CW Staff

PISCATAWAY, N.J. — What do you do when you have a billion-dollar contract and billing system to implement, no previous experience in the area and a nearly impossible deadline that is set in stone by judicial mandate?

Faced with just such a problem last February, AT&T elected to use a fourth-generation language and data base management system rather than build the system in a traditional programming language. The decision was controversial, but AT&T's experience has indicated that high-level languages can be useful in a high-volume production environment where meeting deadlines is a top priority, according to Warren Sobelsohn, a manager in the Information Systems Organization at AT&T.

Called Mica, for the Mechanized Inter-Company Contracts Adminis-

tration, the massive program now under development will track the more than 20,000 contract schedules that must be created to meet the requirements of the divestiture of AT&T, scheduled for Jan. 1.

The AT&T breakup requires that many facilities once owned by AT&T — such as land, buildings and equipment — be divvied up among the communications giant and its divested units.

"In the good old days, one switch could be used to call Alaska or to call your next-door neighbor," Sobelsohn said. "Since we can't throw all those switches away, we designate them to one company or the other. But somebody's got to pay somebody

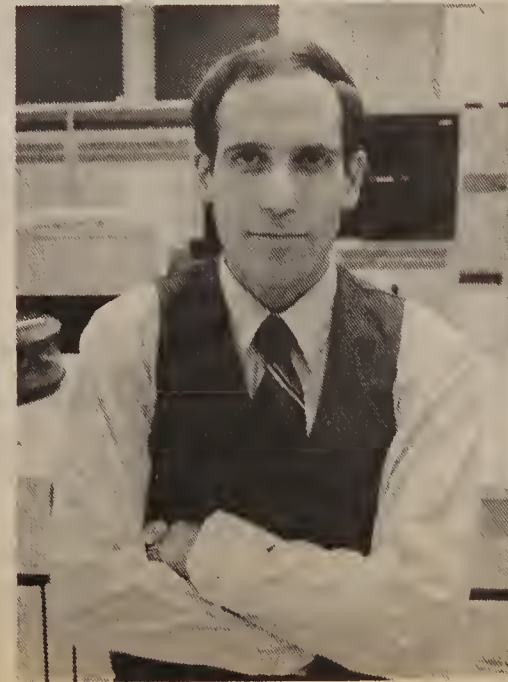
'Every time we'd start to get moving on something, the specs would change.'

— Warren Sobelsohn

else for the use of those switches."

Mica will not only contain the expense and investment accounts for

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IBM Seeking \$750 Million to \$2.5 Billion In Damages From National Semi, NAS

By Jeffery Beeler
 CW West Coast Bureau

SAN FRANCISCO — IBM will ask National Semiconductor Corp. and its National Advanced Systems, Inc. (NAS) subsidiary to pay up to \$2.5 billion in damages for allegedly aiding Hitachi Ltd. in stealing the industry giant's trade secrets.

National Semi and NAS "got their hands on about a year's worth of IBM's research and development" while acting as Hitachi's "principal collectors" of stolen U.S. technology, according to IBM attorney Thomas Barr. As compensation for the disclosure of its purported trade secrets, IBM will seek damages ranging from \$750 million to \$2.5 billion, Barr said during a Nov. 15 hearing before U.S. District Court Judge Spencer Williams.

Announcement of the damage estimate brought a sharp reply from National Semi and NAS lawyer Fred Furth, who accused Barr of "using this courtroom to conduct a press conference" and of focusing on "irrelevancies." Furth disputed the opposition's repeated contention that National Semi and NAS received stolen IBM technology and reminded the court that neither defendant has ever been charged with any criminal wrongdoing in the case.

Barr's disclosure marked the first time IBM has publicly specified the damages it will request in its year-old civil lawsuit against National Semi, NAS and several other co-

defendants. Filed in September 1982 in U.S. District Court, the suit was triggered by the discovery of a Japanese conspiracy to swipe documents containing some of IBM's most sensitive trade secrets.

In addition to National Semi and NAS, defendants in the suit included Tokyo-based Hitachi and 16 of its employees or alleged agents. Hitachi's involvement in the legal action ended last month when the Japanese vendor and IBM resolved their wrangle out of court. Provisions of the settlement purportedly include \$300 million in secret payments to IBM and give the U.S. firm the right to scrutinize its Japanese competitor's new systems products for the next five years.

The civil suit took yet another turn last week when Barr appeared in Williams' courtroom and announced his intention to redraft IBM's original complaint to include specific damage figures and clarify some previously unspecified allegations. Barr expressed confidence that an amended suit could be filed "within 10 days."

Motion to Dismiss Denied

In other developments during last week's hearing, Williams denied a defense motion to dismiss the suit's charge that National Semi and NAS violated a federal racketeering act by receiving and transporting stolen IBM property.

The motion for dismissal originat-

ed with Furth, who also asked the court to drop the suit's third count, which accuses the defendants of engaging in commercial bribery, unfair competition and other offenses in violation of California law. Furth later withdrew the motion, however, after learning of Barr's plans to rewrite the original complaint.

"We don't want to argue [for dismissal of the third count] until we know what's going to be contained in the new suit," Furth told Williams.

Furth's comments came only about an hour after IBM itself moved to dismiss the complaint's second count, in which National Semi and NAS stood accused of violating a federal copyright-infringement statute.

The impetus for IBM's dismissal motion comes from the company's recent out-of-court settlement with Hitachi. "IBM has already been fully compensated by its agreement with Hitachi," Barr explained, and thus has no further need to pursue copyright-infringement litigation against National Semi and NAS.

During the hearing, Barr also informed Williams of a recent settlement of IBM's civil suit against NCL Data, Inc. and its president, Tom Yoshida, both indicted alongside Hitachi in the trade-secrets theft case. The out-of-court agreement was "modeled after the Hitachi settlement," the IBM attorney said, and contains basically the "same injunctive provisions."

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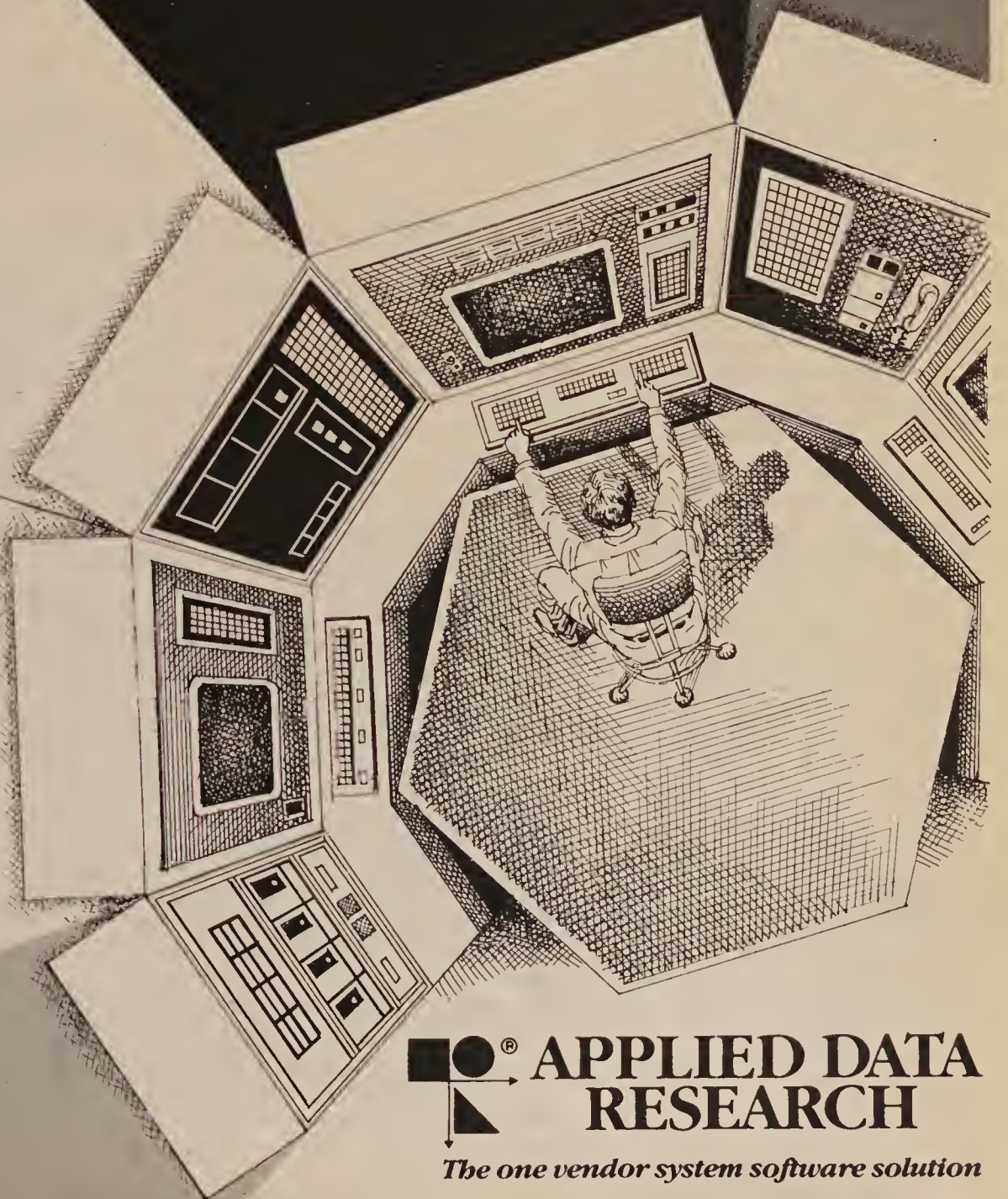
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Supports Up to 10,000 Users

Rolm Releases Business Voice/Data System

By Robert Batt

CW West Coast Bureau

SANTA CLARA, Calif. — Rolm Corp. last week unveiled an end-to-end, high-speed digital business communications system that can reportedly support up to 10,000 voice and data users at distances of eight miles or more.

The CBX II system can support individual user speeds of up to 64K bit/sec and is said to have a total communications-handling capacity in excess of 4G byte/sec. It is the successor to Rolm's current CBX telephone and data switching product line and is directly compatible with previous CBX hardware and software

systems, a spokesman said, noting that current CBX users can upgrade to the new system.

CBX II operates with either a 16-bit Rolm 8000 or 32-bit Rolm 9000 processor. In a CBX II/9000 processor environment with several nodes, each CPU offers a packet network interface called the Control Packet Network for communicating with its peer processors in other nodes and for talking to specialized applications processors.

The CBX II, Rolm explained, is intended to be both a product and an architecture. When fully configured, it has enough bandwidth to switch

23,000 data channels of 192K bit/sec each or 3,000 nodes, depending on user needs. The nodes operate independent of each other and can connect users locally or at distances of more than eight miles using land-based and microwave communications links.

Key Element

The key architectural element of the CBX II is a high-speed, parallel time-division-multiplexed bus called Rolmbus, which appears in two configurations: Rolmbus 74, in use with the present CBX system for the past few weeks, but officially announced last Thursday; and Rolmbus 295, the spokesman said.

Rolmbus 74, which provides 74M bit/sec of data capacity, is intended to fit into standard communications configurations and provides enough capacity to drive currently available voice and data devices. It offers 192 communications channels, each capable of supporting two-way communications at 192K bit/sec, according to the vendor.

Rolmbus 295, on the other hand, has a bandwidth of 295M bit/sec and is designed as a "travelling wave bus," meaning it can be configured to handle future communications requirements, the vendor claimed. The device can handle several successive signals at the same time, with the signal pulses sent through the bus in such a way that they do not interfere with one another. This portion of the

Rolmbus can handle up to 17 directly connected devices.

Other elements in the total system architecture include:

- Inter-Node Link (INL), a non-blocking internode connection that is designed to permit extremely high bandwidth connection between nodes and is available only on systems equipped with Rolmbus 295. Up to 12 fully redundant INL links can be installed on any CBX II node, and they are most likely to be used to perform data swapping operations.

- Rolmlink, used to connect terminal devices to the CBX by providing a basic communications channel of 256K bit/sec bidirectionally from the CBX to the terminal equipment.

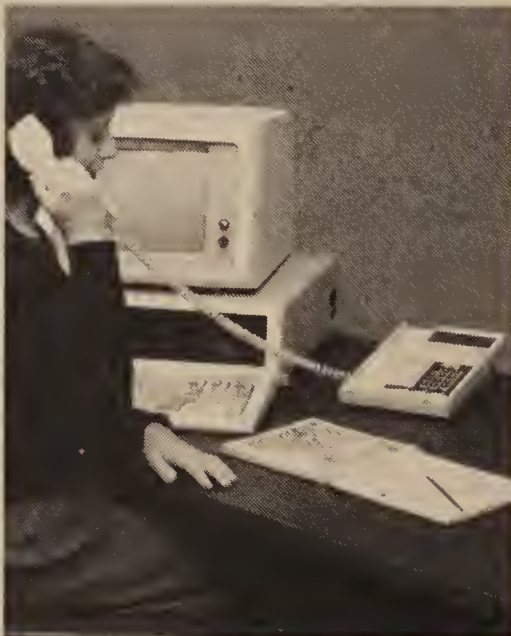
- Dynamically Allocatable Bandwidth, to handle devices that communicate at data rates faster than 192K bit/sec.

The CBX II with Rolmbus 74 is available immediately, the vendor said, and will be priced similarly to the old CBX line, with an average price per line of \$800.

The Rolmbus 295 option will be available at the end of 1984 and will cost 10% to 15% more than the original CBX system.

In addition, Rolm said, current CBX users can upgrade to the full capacity of the CBX II at an approximate cost of between 15% and 20% of the original system price.

More information is available from Rolm at 4900 Old Ironsides Drive, Santa Clara, Calif. 95050.



Rolmphones combine voice and data capability simultaneously over standard twisted-pair wiring.

MDS Unwraps Personal Workstations, Communications Processors for IBM Sites

By Jim Bartimo

CW Staff

PARSIPPANY, N.J. — Mohawk Data Sciences Corp. (MDS) has introduced networked personal computer workstations and communications processors for IBM 3270 environments. When configured with the communications processor, the workstations can communicate with IBM mainframes and over public packet-switching networks.

The Super 21 communications processor and the Hero workstation allow the use of shared equipment and information in an IBM mainframe environment.

The Super 21 software supports all major data communications protocols and connects directly to an interactive IBM 3270 Systems Network Architecture (SNA) or 3776 remote job-entry network, an MDS spokesman said. It also supports Binary Synchronous Communications, Synchronous Data Link Control, X.25 and other protocols.

In addition, the Super 21 processor runs the existing MDS Intelligent 3270 software, which provides a link between locally active Super 21 programs and the central site, according to the vendor.

Users can write programs that permit remote workstations to access mainframe data, process and update it locally and return it to the mainframe.

The Hero workstation consists of a CRT display, keyboard and a modular processor that incorporates a 16-bit chip architecture and at least 256K bytes of random-access memory (RAM). The workstation's storage units are textbook-size and snap together for system expansion.

The workstation also incorporates two RS-232 ports with a modem controller that can be operated in both synchronous and asynchronous modes at speeds up to 19.2K bit/sec. It features an RS-422 port for cluster operations at speeds up to 1.8M bit/sec and a parallel printer interface, the spokesman noted.

The Hero's keyboard includes a 98-key standard typewriter layout and five key pads: one each for cursor control, status control, numeric input, page control and user-definable functions.

Support H/OS, MS-DOS

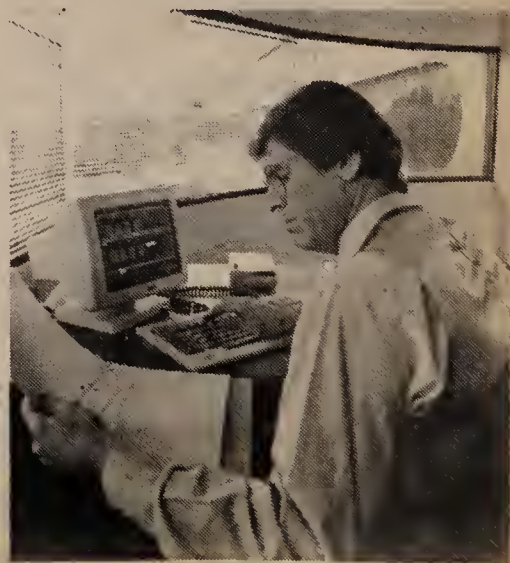
Finally, the workstations support MDS' H/OS operating system for multitasking capabilities and Microsoft, Inc.'s MS-DOS operating system Version 2. The screen can be split into multiple windows within an application — each with its own cursor — and scrolling can be performed in each window independently, the spokesman said.

The Hero is available in five models, while the Super 21 communications processor comes in four mod-

els. A typical entry-level system consisting of four workstations, each with 256K bytes of RAM, and one Super 21 processor with 5M bytes of disk storage, two communications ports and Intelligent 3270 SNA software costs about \$22,550.

An expanded system, including 16 workstations and one communications processor with 60M bytes of disk storage, 512K bytes of RAM, two ports and SNA software will cost about \$70,100.

The products will be available in the first quarter of 1984, MDS said from 7 Century Drive, Parsippany, N.J. 07054.



An MDS financial manager uses the Hero workstation to conduct a spreadsheet analysis.

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DG Supermini Boasts 256K-Byte Chip

By Tom Henkel
CW Staff

WESTBORO, Mass. — Data General Corp. last week announced a 32-bit superminicomputer that is reportedly the first domestic processor to use 256K-byte dynamic random-access memory chips and 2,000-gate logic gate arrays.

The Eclipse MV/8000 C, an OEM version of the 32-bit Eclipse MV/8000 supermini, is the result of a cooperative agreement between DG and its Japanese subsidiary, Nippon Data General.

DG last week also announced an array processing unit for the MV/8000 line, the Arrayplus 2000, and an OEM migration aid, which allows us-

ers of 16-bit architectures to move to the 32-bit MV/8000 C.

Not Complete System

The MV/8000 C offers roughly the same performance as DG's commercially available MV/8000 II. The MV/8000 C, which is only a central processor and not a complete system, is available in a 10½-in. rack-mountable unit.

The MV/8000 C, which has a maximum disk storage capacity of 5.6G bytes, offers 1M or 4M bytes of main memory. Only the 4M-byte version, however, uses the 256K-byte memory chips; the 1M-byte configuration uses 64K-byte memory chips.

DG developed the designs for the MV/8000 C domestically, but will

manufacture the processor in Japan through Nippon Data General. Nippon Data General developed the processor boards for the system; the 2,000-gate logic gate arrays and 256K-byte memories, which are integrated into the system in the U.S., come from several unspecified Japanese suppliers.

A 1M-byte MV/8000 C costs \$55,500 with DG's AOS/RT32 operating system. The 4M-byte version costs \$85,500, including the operating system. Both systems are available in 120 days, DG said.

Array Processor

The Arrayplus 2000 floating-point array processor announced for DG's MV series processors was designed

for imaging, modeling, simulation, signal processing and other scientific applications that require rapid computations of large blocks of data. Priced at \$18,000, it will be available in 120 days, DG said.

The migration aid announced by DG last week is an OEM software product called Rdos Agent. It allows users of 16-bit DG Nova and Eclipse systems to write programs under DG's Rdos operating system, which is used on the MV series.

Rdos Agent was developed as a migration path from 16- to 32-bit architectures. Available now, it costs \$3,000 for an initial license fee and \$1,000 for subsequent licenses.

DG is located at 4400 Computer Drive, Westboro, Mass. 01580.

New Technology Offers Edge For Users

What does the new technology in Data General Corp.'s MV/8000 C processor mean to users?

For one thing, the use of 256K-byte dynamic random-access memory chips means the MV/8000 C takes up less space than its commercially available counterpart, the MV/8000 II, according to technology expert Howard Dicken, president of Scottsdale, Ariz.-based DM Data, Inc., a high-tech consulting firm.

DG said it was able to design the MV/8000 C to fit into a 10½-in. rack-mountable unit by eliminating four circuit boards from the system. This was done by reducing the system cache memory from four circuit boards to one, a DG spokeswoman explained.

Aside from taking up less space, the 256K-byte chips are expected to be more reliable because they employ newer packaging technologies.

Using 256K-byte chips is expected to be the most cost-effective way for vendors to build computer systems in the next one or two years, Dicken said. In fact, several vendors are currently working on final processor designs which incorporate 256K-byte memory chips.

Dicken was skeptical, however, that DG would be able to acquire the memory chips in sufficient quantities and cheaply enough to throw the MV/8000 C into full production. It will probably be at least a year before DG will benefit from a dramatic reduction in production costs resulting from using the 256K-byte memories, he said.

The use of 2,000-gate logic gate arrays in the MV/8000 C also appears to be an industry first, Dicken noted. Many firms have been using gate arrays, standardized chips which can be custom-configured to a vendor's specifications, but this appears to be the first time a vendor has used 2,000 gate chips.

IBM has been using 700 to 1,500 gate arrays for some time, Dicken pointed out.



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AT&T Rushing to Meet Divestiture Deadline

(Continued from Page 1)

each contract, but will generate bills based on usage. Sobelsohn estimated that first-year billings will exceed \$1 billion.

When the Mica project began to take shape in February, the company considered hiring a contractor who proposed to develop it on microcomputers. The subsequent growth of the project would have made that decision "disastrous," Sobelsohn said.

The Information Systems Organization proposed developing Mica in-house using Ramis II, the fourth-generation language and DBMS from

Mathematica Products Group, Inc. of Princeton, N.J. Within two days, two Ramis programmers put together a mainframe prototype and demonstrated it to the contract specifiers. "I have never seen a prototype work so easily," Sobelsohn commented.

The project was begun using Ramis in February. Working initially without specifications, a team of 12 programmers assembled the first release, incorporating an estimating module by April. The module contains costing algorithms that allow owners of the contracted equipment to input usage and expense figures.

The program helps build the contract schedule data base from there.

As users began inputting test models, unanticipated needs arose almost immediately. "Every time we'd start to get moving on something, the specs would change," Sobelsohn said. "People who were coming on this from other areas had never seen it so busy."

A capability to handle revenues lost from early contract termination had to be incorporated. Other users discovered they needed a facility to handle accounting periods other than a year. The volume of changes required has warranted the division to issue "releases" rather than enhancements of the program, with four versions issued to date.

Acid Test

The acid test of Mica will come in early February, when the Information Systems Organization will dispatch the bills for usage in January, the first month of divestiture. With the deadline near, the developers are allowing owners of the contracts to build the data base as the project proceeds. Editing procedures are built in, and a number of reports are generated as the data base is being built to ensure accuracy, according to Sobelsohn.

Testing and revisions are also being made interactively. Updates are performed by a data base administrator using what Sobelsohn called "a nifty little batch facility for VM," de-

veloped internally at AT&T.

When completed, Mica will reside on a VM-based system at Information Systems Organization headquarters in Fairhaven, N.J. IBM MVS-based systems at user sites will run expense information and transmit it to Mica via Ttran, an AT&T proprietary data communications facility. The data will be used to update the Mica files, and a general billing file will be sent back to the user MVS sites via Ttran for local bill generation.

The capabilities inherent in fourth-generation languages have enabled the project to stick to its deadlines so far. "If we had had to use PL/I with IMS, based on my experience, we would not have met the development schedule," Sobelsohn said.

In particular, he praised the ad hoc reporting capabilities of Ramis II, its ability to access various data bases and its flexibility for making changes on the fly. He also noted that various programmers have been transferred to and from the project and have been productive almost immediately.

However, "you pay some kind of price" for those capabilities. For all its flexibility, Ramis offers limited facilities for customizing procedures, Sobelsohn said.

For example, a table request against a whole file is performed by a Ramis macro. "It would be nice if we could get in it with our own hands," he remarked.

Inexperienced Users Building Bell's Data Base of Contracts

PISCATAWAY, N.J. — The data base of contract schedules that will make up AT&T's Mechanized Inter-Company Contracts Administration (Mica) is being built interactively by users, many of whom "have never seen a terminal before," according to Bob Sauer, a manager in AT&T's Information Systems Organization.

In response, AT&T system designers have built in extensive editing and prompting features to allow the data base to be created with little or no help from data base administration.

Mica relies heavily on menus, prompts and execs written in Ramis II, a fourth-generation language and data base management system from Mathematica Products Group, Inc. of Princeton, N.J., to guide users through data base creation and shield them from the underlying functions.

Users on remote terminals log on with an identification under IBM's VM operating system and are logged immediately into Ramis II, Sauer explained. Once in Ramis, all operating system commands are disabled and the user is presented with a menu of the functions which are available under his ID.

Ramis II execs are used to bring the user into data base creation or other menus. Users need not know

Ramis II to add to or update the data base; a series of prompts leads the user through the process of entering chains of data.

Entries are edited in a Ramis II exec for range, value and lengths and table lookups and error messages are included. At any time the user can drop into an uncontrolled Ramis II environment to produce an ad hoc report. However, he cannot access CMS from that environment.

At the end of a record entry, a record management routine is automatically invoked to update the data base while the user proceeds onto the next record.

Response Time Problem

With more than 250 users authorized to create Mica data bases, response times have been a problem, Sauer admitted. Developers have cut down response times by using several Ramis minidisks on the mainframe. The concept is similar to a syslib, with each user having a unique ID for access to Ramis.

Although the size of the data base has created time problems, Ramis II has performed well, Sauer said.

"It's never been down because of bad data bases and we haven't lost any data bases," he noted. "It seems to handle most everything we want it to do."

Successor to DEC's VT100 Offers Detached Keyboard

(Continued from Page 1)

characters can be stored in the terminal so that commonly used commands can be invoked with one keystroke, a DEC spokesman said.

The VT200s, which have more of the characteristics of DEC's personal computer monitors than the VT100s, look completely different from the VT100s. For example, the VT200s have a wedge-shaped monitor, like the monitor used with DEC's Rainbow personal computer. A nonglare screen is included, as well as a 60 image/sec screen refresh rate to limit the on-screen flicker that was common with the VT100.

The new hardware design also includes the detached keyboard, which features sculptured, matte-finished keys and an acoustic key click.

The VT200 uses a cursor-driven, menu mode selection process rather than the previous setup modes offered with the VT100. The menus are in English but can be purchased in German or French, DEC noted.

Other features of the VT200 include:

- **CRT Save**, a function that blanks out the screen image after 30 seconds to prevent images from burning out the terminal's phosphor. Data can reportedly be redisplayed by touching any key on the terminal's keyboard.

- A serial printer port and downline-loadable character set, which is said to allow as many as 94 characters to be loaded into the terminal from

the host processor.

DEC's next step will be to link the VT200 terminals with Xerox Corp.'s Ethernet local-area network, Olsen said.

Descriptions, Prices

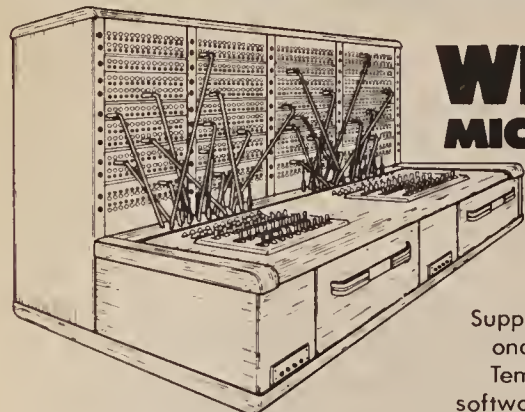
The VT220 is a two-piece unit consisting of a monitor, detachable keyboard and 12-in. monochromatic screen. The screen can be purchased in standard black-and-white, green or amber, the DEC spokesman said, and will display 80- or 132-col. by 24-line display. It costs \$1,295.

The VT240 is a three-piece unit consisting of the monitor, detachable keyboard and system box. The 12-in. display features a screen resolution of 800 by 240 pixels that will display 80 or 132 col. by 24 lines. Two graphics planes allow for four levels of gray. The terminal will support DEC's Regis and Tektronix, Inc.'s 4010 and 4014 graphics protocols. It is priced at \$2,195.

The VT241 also consists of three pieces — the monitor, system box and keyboard. It features a 13-in. color display with 800- by 240-pixel resolution and a display of 80 or 132 col. by 24 lines. Two graphics planes allow use of four colors out of a palette of 64. It is priced at \$3,195 and supports DEC and Tektronix protocols.

All three VT200 terminals are available immediately. More information is available from DEC, 200 Baker Ave., West Concord, Mass. 01742.

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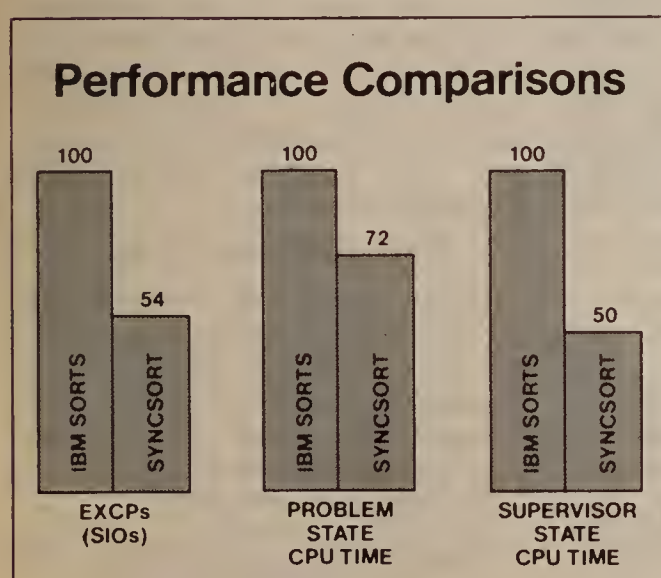
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Customs Agent Praises Vendors for Cooperation

By Peter Bartolik
CW Staff

While lobbying groups that represent high-technology vendors oppose more restrictive versions of the export act, vendors do cooperate with enforcement officials to detect sales to agents of Soviet bloc countries.

Groups such as the Computer Dealers and Lessors Association have lobbied hard against more restrictive regulations, claiming communist countries can obtain much the same equipment from vendors in friendly countries. One vendor believes cooperation results in "mutually acceptable" regulations.

In a recent interview with *Computerworld*, William Simmons, the U.S. Customs Service's special agent-in-charge of the Northeast District, said information is a key to interceptions. Since the beginning of Customs' Operation Exodus program in December 1981, "most of the good information has come from private industry. We have gotten tremendous cooperation."

Simmons' district, which encompasses New England and parts of the Canadian border, has made about 130 seizures valued at about \$5 million since Exodus began. "We have agents who have met with most of the high-tech industry in the area, and we're doing that on a continuing basis," he noted.

The FBI's Program

The Federal Bureau of Investigation has a similar, less publicized program designed to blunt the more traditional type of foreign technical espionage. Begun in the late 1970s, the Development of Counter Intelligence Awareness (Deca) program is composed of agents in each of the FBI's 59 field offices who visit companies awarded classified government contracts "to raise their level of awareness," according to William Carter, an FBI spokesman in Washington, D.C.

The day before the recent seizure of the Digital Equipment Corp. VAX-11/782 superminicomputer in West Germany (story on Page 1), the assistant director of the FBI's Intelligence

Division, Edward J. O'Malley, met with 30 executives from the greater Boston area in a closed-door "foreign counterintelligence awareness briefing." The discussion reportedly focused on the more traditional technology espionage, where spies attempt to obtain classified informa-



tion from companies that have contracts with the U.S. government.

The meeting was arranged by and held at Prime Computer, Inc. in Natick, Mass. Prime would not name the companies who attended, but did say most attendees were either chief executive officers or top research and development executives, along with a few security executives.

The meeting was initiated by Prime as a result of its work with federal law enforcement agencies, according to company spokesman Jo-

seph Gavaghan.

Prime has not taken a public position on renewal of the export act, but according to Gavaghan, "believes the most effective way to protect from the loss of technology is to work closely with government agencies to develop mutually acceptable regulations."

Gavaghan said the company involves all phases of its operations in the issues of export compliance and works closely with law enforcement officials.

Number of Spies in U.S. on Rise, FBI Says

The number of officials assigned to the U.S. from communist countries has more than doubled over the past decade, and counterintelligence services here and abroad believe that roughly one out of three such officials is an intelligence officer — a spy, a pamphlet recently published by the Federal Bureau of Investigation contends.

A large number of business representatives, scholars and others visiting the U.S. from foreign countries are also working for or on behalf of their respective intelligence services, according to "The Unseen Conflict — Foreign Espionage Operations Against The United States." The pamphlet was published by the FBI's Intelligence Division "to heighten Americans' awareness of the presence and dangers of foreign intelligence efforts to obtain sensitive information," wrote FBI Director William H. Webster.

The pamphlet alleges "the central mission of hostile intelligence service officers" is to assess and recruit Americans as agents and "as middlemen to acquire technology that has been embargoed from export." Even if the recruit has no direct access to targeted material, he can be used as a "spotter" to provide personal data on Americans who do have access.

The pamphlet details several techniques, along with actual examples, for recruitment:

Financial: Tactics geared to exploit material needs are perhaps the

most common and most effective means of recruitment, according to the FBI. "An intelligence officer will initially solicit innocuous material, responding with gifts or small sums of money, and then gradually attempt to acquire more sensitive information."

Blackmail: Seldom, if ever, employed within the U.S., according to the FBI, blackmail attempts are not uncommon when Americans tour the Soviet Union and other East European countries where "hostile intelligence services can play rough." Another tactic is the exploitation of situations where a targeted person has relatives in communist countries who can be pressured.

"False Flags": Intelligence operatives misrepresent themselves as citizens of countries friendly to U.S. interests or countries or entities to which a target is particularly sympa-



thetic. In a case in the mid-1970s, an American of Armenian extraction was approached by an Armenian claiming to be a distant relative working with the Soviet Union to reclaim lost Armenian lands from Turkey; the target was reportedly duped into turning over classified material.

Ideology: Not used as frequently as in earlier decades, this tactic plays on the ideological beliefs of a target, such as one's desire to work for world peace, according to the FBI. One such target, studying in Europe in the mid-1970s, was talked into returning to the U.S. and seeking employment in a sensitive position; he was reportedly discovered.

Naivete: "An intelligence officer or agent in the role of a 'student' may urge an American 'colleague' that knowledge has no political boundaries or that the field of science is beyond politics," according to the FBI's scenario. "In the interests of scholarship and science, the American is encouraged to exchange the results of his research with a fellow member of the international community of scientists."

Magnuson Co-Founder, Associates Cleared of Trade Secrets Theft

By Jeffry Beeler

CW West Coast Bureau

SAN JOSE, Calif. — Magnuson Computer Systems, Inc. co-founder Paul Magnuson and two of his business associates have been absolved of any wrongdoing in a computer crime and trade secrets theft case dating back to late 1982.

Citing lack of evidence, a Santa Clara County Municipal Court judge dismissed all charges in the case against Magnuson and his codefendants, Samuel Dottle and Kevin Anderson. The dismissal, announced during a recent courtroom hearing, followed an admission by local prosecutors that the case's technical intricacies had led them to misconstrue the evidence against the defendants and charge the trio unfairly.

The roots of the case go back to a Dec. 2 criminal complaint that accused Magnuson of stealing technology from the firm that bears his name and transferring the information to Prodigy Systems, Inc., his latest start-up [CW, Dec. 13, 1982].

At the time, authorities suspected Magnuson of having gained unauthorized access to a Magnuson Computer Systems mainframe several months after he quit the supplier of

IBM-compatible processors to devote his full energies to Prodigy. The break-in was believed to have netted the entrepreneur an estimated \$100,000 worth of Magnuson Computer Systems trade secrets, including printed-circuit board layout data, an engineering change-order facility and a printed-circuit board design automation system.

Subsequent Investigation

During a subsequent investigation by the county sheriff's department, the proprietary Magnuson Computer Systems technical information was found to have been entered into Prodigy's central computing system, according to the complaint.

Since then, however, local law enforcement officials have reexamined the evidence in the case and have abandoned their belief that Magnuson and his codefendants acted criminally, according to the county's assistant district attorney, Douglas Southard.

The Magnuson Computer Systems technology in Prodigy's central system held little value for a competitor and found its way into Paul Magnuson's hands largely by accident, Southard said.

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Embargoed VAX Believed on Way to Soviets

(Continued from Page 1)

equipment actually was unloaded in South Africa earlier in the year or remained on the ship, which had recently sailed from the U.S.

Published accounts from West Germany said the equipment was seized on a ship that called in South Africa and then continued on to West Germany.

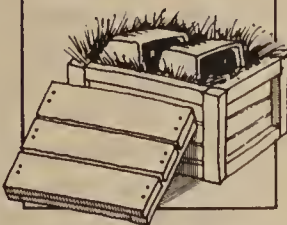
The equipment may have been the most sophisticated unit ever seized during shipment, according to both Walker and Customs spokeswoman Chris Frazee. "It was certainly the largest and most expensive and highest in terms of state of the art," Frazee said.

The seizure of the sophisticated superminicomputer comes at a time when law enforcement officials are urging passage of a stricter version of the expired Export Administration Act and criticizing a House of Representatives-approved bill that they

claim will weaken their means of preventing shipments such as the DEC unit. The House bill would provide for one-time licensing for multiple exports, as opposed to the current system of individual export licenses [CW, Nov. 14]; other versions of the bill would provide government agencies with greater authority to restrict imports.

Walker said the House version of the act would cut the export administration budget by one-third and

ILLEGAL EXPORTS



would probably reduce the number of agents stationed abroad, who presently acquire valuable intelligence information. It would also allow inspections of outbound shipments only when there was prior information that a shipment could be illegal and would prevent Customs from following up investigations after seizures, he added. His department urges retaining the status quo of the previous version of the act.

In a recent speech, Commissioner of Customs William von Raab declared opposition for the House-approved version of the new export act. He pointed out that Operation Exodus, a two-year-old special interception program, has referred to the U.S. Justice Department 350 cases of ille-

gal exports of high-tech equipment and actual weapons of war and has uncovered "wide gaps" in U.S. ability to safeguard strategic technology. "The Customs Service is involved in a number of lengthy and complicated investigations into conspiracies which, when they become public knowledge, will shake the high-technology industry to its roots," Raab said.

Operation Exodus has placed specially trained teams of agents at Customs ports of exit around the country and resulted in 276 arrests, 211 convictions and interception of almost 2,000 shipments of improperly licensed or otherwise illegal export materials valued at almost \$100 million [CW, Aug. 15].

Customs Offers Detection Tips

Vendors may be able to detect the purchase of high-technology items made on behalf of Soviet bloc countries if they look for warning signs compiled by the U.S. Customs Service for its Operation Exodus program, which attempts to prevent the shipment of embargoed high-technology and military equipment.

The Customs Service offers the following tips to detect agents for foreign purchasers even if an order is purportedly for domestic use:

- The specification of 230V/50 Hz, 115V/50 Hz or unusual power cords, plugs, fuses or power lines.
- Requests for illogical options.
- Instructions for special salt spray or humidity packing.
- Instructions to make direct shipments to trading companies, freight forwarders or export companies.
- Circuitous or economically illogical routing, particularly through Canada to a non-Canadian end user.
- Instructions to deliver to companies with no apparent connections to the purchasers.
- Requests for cubic volumes and/or packaged weights, particularly in metric tons.
- Certification as to country of origin or conformity to international standards.

• Payments involving drafts drawn on foreign banks or other special banking requirements.

• Requests for exemption from state tax but an unwillingness to provide resale identification numbers.

• Orders placed by firms or individuals from foreign countries other than the country of the end users.

• Unusual behavior by customers and unusual or extremely lucrative financial compensation for products.

The Customs Service, in advisories it sends out regularly, stresses the need for corporate personnel to know current regulations and to follow appropriate screening and licensing procedures. A number of publications are available from the Department of Commerce, including a summary of export regulations.



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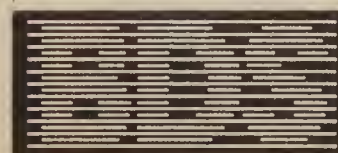
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Tax-Exempt Status at Stake

Users Groups Still Confused About IRS Ruling

By Tom Henkel
CW Staff

What did the Internal Revenue Service (IRS) really mean when it ruled that computer users groups devoted to a single vendor's product line do not qualify for tax-exempt status?

Most users groups were still confused about the IRS decision nearly three weeks after the agency issued Revenue Ruling 83-164 [CW, Nov 14]. Although several users group administrators told *Computerworld* they are confident the ruling does not apply to their groups, all of the administrators contacted by *Computerworld* last week offered different reasons why they should qualify for tax exemption.

A spokeswoman for Guide, the group for users of small to medium-scale IBM systems, said that the organization believes it qualifies for tax-

"The Oct. 31 revenue ruling . . . states that 'any organization whose members represent diversified businesses that rent or lease computer products from a single computer manufacturer does not qualify for exemption from federal income tax as a business league.'"

exempt status because its membership includes users of several types of IBM systems. And Interact, a Management Science America, Inc. (MSA) users group, believes it will not have a problem with the IRS because the group is set up as a non-profit organization. Still another users group, /USR/Group, Inc., a federation of users of the Unix operating system, does not expect to be affected because its membership includes users of many different hardware systems.

An IRS spokesman said he could not comment on whether individual organizations would qualify for tax-exempt status. He referred to the wording of the Oct. 31 revenue ruling, which states that "any organization whose members represent diversified businesses that rent or lease computer products from a single computer manufacturer does not qualify for exemption from federal

income tax as a business league."

To get a decision on the exemption issue, the IRS spokesman said, users groups should contact the agency and identify their inquiries as being related to Revenue Ruling 83-134. The inquiries should be sent to the Office of the Assistant Commissioner (Employee Plans and Exempt Organizations), Internal Revenue Service, 1111 Constitution Ave. N.W., Washington, D.C. 20224.

Home Free?

Ron Beck, chairman of MSA's Interact, thinks that newly formed organizations should be home free. He explained that users of MSA software products, which are targeted mainly at large IBM mainframe environments, formerly belonged to several different profit-making users groups organized around various MSA products. (Beck himself was chairman of Future, a users group for MSA's general ledger software).

However, before the IRS issued its new ruling, the separate MSA users groups merged into one large users group. Unlike the now-defunct smaller groups, Interact has been organized not to turn a profit. The group plans to determine each year how much it will cost to cover operating expenses and hold user conferences; it will then set a budget and charge users an annual membership fee. If Interact goes over that budget,

MSA will pick up the bill, Beck said.

/USR/Group has already been granted tax-exempt status under California law, but the organization has waited about 18 months to receive word from the IRS on whether it will be exempt from federal income taxes. Saying that a long delay from the IRS is often a good sign, the group's president, Mike Florio, is confident /USR/Group will be granted a federal tax exemption.

Florio's confidence stems from the fact that /USR/Group is comprised of many different types of Unix users. For example, there are different versions of Unix compilers offered by different vendors.

In addition, some Unix implementations are based in hardware, others in software. Florio, therefore, contends that /USR/Group is an organization based around a whole industry.

While some users groups are hoping their organizations will be spared a negative IRS decision, the Prime User Group (PUG) plans on taking action. According to the organization's accountant, Harold Williams, the users group is preparing to file a formal appeal with the IRS contesting the ruling on the grounds that PUG provides an educational service to users of Prime Computer, Inc. hardware. Williams said PUG's attorneys are currently reviewing the appeal.

Correction

CIT-Alcatel of France, which is engaged in a joint research and development project with Carlo Olivetti, Inc., was incorrectly identified in the Nov. 14 "International Report" as CII-Alcatel. Olivetti and CIT-Alcatel are collaborating on microprocessor-based electronic typewriters with microcomputer capability.

WHAT TO LOOK FOR WHEN TRIES TO GET ITS F



Wells Fargo Tying Micros Into Overseas EFT Net

By Katherine Hafner
CW Staff

BOSTON — Wells Fargo Bank in San Francisco, the world's 11th largest bank, is integrating microcomputers into its overseas electronic funds transfer (EFT) operation.

Addressing a conference on EFT held here last week by the Bank Administration Institute, John W. O'Connell, vice-president for Global Payment Services at Wells Fargo, described the applications that have been devised for handling overseas transfer inquiries, a sensitive process fraught with potential for mistakes.

For the past 15 months, the bank has been steadily installing IBM Personal Computers in its wire room to help control and manage the heavy volume of transfer inquiries received each day, according to O'Connell. With a base of approximately 100 microcomputers, systems consultants devised custom software applications and set up a communications network for the machines.

Working independently of the bank's mainframe, the microcomputers contain applications that feature a simulation program for potential mishaps. According to O'Connell, the independent micros were chosen in lieu of tying an inquiry system to the bank's mainframe because "waiting for systems to come up with applications for us would have taken too long. So the idea for using personal computers came out of the exposure we've all had to micros."

Although the IBM Personal Computers are "not the best or the fastest," O'Connell said, "they are pervasive and easy to justify to the senior level." Citing access as a consistent problem, O'Connell said the bank has experimented with multiple keyboards on an Eagle Computer Corp. microcomputer.

"Once we saw how quickly we could develop applications, the use of the micros mushroomed," O'Connell added.

Most of the inquiries that come in from other banks usually result from a mistake that has occurred somewhere in the transaction. "Six percent of all wires sent result in some

sort of inquiry," O'Connell reported. "There's all kinds of potential for doing it improperly."

Although the Personal Computers do not ordinarily speed up the inquiry, having certain files tracked automatically "gives you better control on the inquiry in-house," O'Connell said. "Most importantly, we can keep much better track of where we make most of our errors."

Most helpful of all the applications, O'Connell said, is a simulation program that presents the user with potential disaster scenarios. The program simulates unusually heavy days with unanticipated downtime.

"Running a wire room is a lot like

being a pilot in a 747 ... The day starts at zero [transactions] and then gets fast and furious. The simulation program helps people make decisions faster under duress and time pressure."

Another application devised by the bank's systems consultants is called Micro Express, which provides a customer with a terminal to do "cash-management-related things." Approximately 10 Wells Fargo customers currently use Micro Express.

The computers are also being used for the bank's own electronic mail system and for Lotus Development Corp.'s 1-2-3 for graphics and data base management.

Increased Access to Supercomputers Urged

WASHINGTON, D.C. — Representatives of the scientific and academic communities last week urged Congress to support efforts aimed at providing greater researcher access to supercomputer facilities.

Purdue University President Dr. Steven C. Beering told the House Science and Technology Committee Tuesday that research at universities and other institutions is severely restricted by a lack of computer capabilities. Testifying on behalf of the Association of American Universities, Beering blamed this restricted access on three factors: lack of researcher training or experience with supercomputers; lack of funds to

support supercomputer acquisitions and use; and lack of physical access because of a scarcity of university supercomputer sites and a lack of adequate telecommunications facilities to access machines at other locations.

Beering said the National Science Foundation (NSF) has not sufficiently promoted access to supercomputers in its grant awards. He strongly recommended that NSF provide more support for supercomputing in academic computing centers.

In testimony before the committee the next day, NSF Director Dr. Edward Knapp said the foundation's newly formed Advanced Scientific Computing Resources Task Force is

developing plans for providing researcher access to supercomputers.

In addition, Knapp said, the foundation is trying to improve access on a long-term basis. Discussing this effort's objectives, the NSF director said the foundation wants to provide access in order to develop "the new generation of computational scientists and engineers."

In addition, he said, NSF will seek ways to improve remote access to supercomputers, develop supercomputer facilities at universities and support academic research in the areas of supercomputer architecture, computational mathematics, software and algorithms.

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GTE Telenet Exec Calls for Anti-Hacker Law

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — Warning that telecommunications networks are becoming "an electronic playpen" for computer hackers, an executive of GTE Telenet Communications Corp. recently urged Congress to pass a federal law against "computer trespass."

Appearing before a House of Representatives judiciary subcommittee considering computer-related fraud legislation, Peter C. Waal of GTE Telenet, whose network has been used by a number of hackers seeking unauthorized access to computer systems, said, "It is our feeling that this trespass problem is of equal or perhaps even greater national impor-

tance than that of the use of computers in fraudulent transactions."

Noting estimates that there will be more than seven million personal computers in use within three years, nearly two million of which will have communications capabilities, Waal, vice-president of marketing and plans for GTE Telenet's Network Services Group in Vienna, Va., said there will be 10 times the number of potential hackers there are today.

These numbers and the interstate nature of computer networks and illegal hacking activities make a federal law mandatory, according to Waal. Because there is a widespread perception that computer trespass is not wrong, "so long as there are no directly applicable federal laws on

electronic trespass, the problems will continue and will stand as a barrier against solving other problems."

In particular, Waal told the Judiciary Subcommittee on Crime during his Nov. 10 appearance, computer-related fraud problems cannot begin to be successfully addressed until there is legislation addressing computer trespass. He said GTE Telenet advocates that "an appropriate law would vary its penalty with the nature of the harm, with fraud being severely punished and trespass less so."

Looking at the potential long-term harm from illegal hacking activities, Waal told the subcommittee that "the hacker's hobby will inevitably induce cost growth in our eco-

nomic system due to the necessary overdesign of systems to handle intended work in addition to the load imposed by hackers." This, he concluded, would "force our whole economic system to bear the costs of an electronic playpen for the hackers."

Datacomm Briefs

Alteration of Dial Tones Approved by FCC

WASHINGTON, D.C. — Subscriber-generated dial tones can be altered as part of a "basic" service, the Federal Communications Commission (FCC) decided early this month in a clarification of its Second Computer Inquiry decision.

The FCC also indicated that it will not allow the decision to hamstring the addition of new technology to dial-up telephone service and other basic offerings. There is some chance of that because a key provision of Computer Decision II bars AT&T and its operating companies from offering end-to-end protocol conversion as part of a basic offering. What constitutes end-to-end protocol conversion, however, has never been totally defined.

In its latest pronouncement on the subject, the FCC attempted to reduce this ambiguity by citing conversion of voice signals from analog to digital and vice-versa as one example of end-to-end protocol conversion that basic carriers would be allowed to perform if they requested a waiver of Computer Decision II's restraints.

In general, the FCC added, where there is no change in an existing service but only a change in electrical interface characteristics to facilitate introduction of new technology, "petitions for waiver will be acted on expeditiously to ensure that new technology . . . will be employed."

AT&T Asks Quick OK Of New Service

WASHINGTON, D.C. — AT&T has asked the Federal Communications Commission (FCC) for permission to offer a new international-wideband service one day after filing the tariff instead of waiting the usual 90 days.

Known as the International Accunet Reserved 1.5 Service, the offering consists of a full-duplex, digital 1.5M bit/sec transmission channel. Its primary application would be videoconferencing.

The first two locations served would be New York and London over circuits furnished jointly by AT&T and the British Telecommunications Authority. AT&T plans to charge \$625 for 30 minutes of use. The British have said they will charge about \$900 for each hour; they are reportedly willing to provide service in half-hour increments, but the cost has not been disclosed.

AT&T said the new service can support computer-to-computer data transfer, high-speed facsimile and digital voice communications.

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Simple Measures Not Enough

Encryption Endorsed as Way to End Hacking Plan

By Jake Kirchner

CW Washington Bureau

GAITHERSBURG, Md. — In the wake of recent revelations that youthful hackers have been regularly accessing computer networks around the country, security experts have proclaimed that a few relatively simple and inexpensive measures, such as better passwords, would deter much of the unauthorized access.

But according to several such experts who spoke at a conference here last week, those low-cost but effective measures may escalate the nature of computer vulnerability and eventually force system managers to implement much more expensive data encryption devices.

"The way to stop the hackers is to use a good password management system," said Melville Klein, director of the Defense Department's Computer Security Center (CSC). If a hacker "can't guess the passwords," he added, "you're going to force him to commit a crime" by making him tap a system's communications links if he wants access.

"How do you keep people from exploiting your communications?" Klein continued. "You encrypt them."

Klein's remarks came at a press conference held during last week's sixth annual computer security conference at the National Bureau of Standards (NBS) headquarters here, sponsored by CSC and the NBS Institute for Computer Sciences and Technology.

Delivering the conference keynote address, Dr. Richard D. Delauer, under secretary of Defense for research and engineering, said that given current technology, encryption "can be a way of life" for computer systems management. The task, he added, is to make encryption affordable.

Elaborating on that point later, Klein noted the Data Encryption Standard (DES) was adopted by the federal government six years ago, but still is not widely used. "It is not a question of availability of good communications security," he said, but rather one of promoting its use within the DP community.

Dr. Dennis Branstad, manager of the NBS Computer Integrity and Se-

FCC May Reduce Orbital Spacing

WASHINGTON, D.C. — There may not be enough orbital slots to accommodate all of the 22 companies that have requested Federal Communications Commission (FCC) permission to launch and operate domestic communications satellites, an FCC spokesman said earlier this month.

If that happens, the FCC is likely to reduce the present two-degree orbital spacing to one degree.

Western Union proposed three C-band (4-6GHz) satellites to supplement the four satellites already authorized, plus three Ku-band (12-14GHz) satellites.

Satellite Business Systems, American Satellite Co. and RCA America Communications, Inc. were among the other applicants.

curity Technology Group, told reporters DES functions could be built into computer terminals for very little money, but DES devices added to existing machines are considerably more expensive. He estimated that the devices available today cost between \$2,000 and \$3,500 per terminal; if that capability were built in, however, it would cost less than \$100 per terminal.

Branstad and Robert Courtney, a security consultant and former IBM executive, remarked that several firms, including IBM and Motorola, Inc., have taken DES devices off the market for lack of demand. Branstad said, however, that several vendors

are now considering adding encryption protection to their equipment.

The security experts also said that except for data communications involving sensitive or valuable data or money transfers, encryption is not the first step. Although encryption should be more widely used, the immediate threat, they said, is not from wire tappers or even from slightly sociopathic hackers. The biggest threat to computer security is from inside the organization, particularly from clerks and other administrative personnel, they said.

According to Klein, "in the private sector . . . it's primarily a prob-

lem of [employee] security. . . . If they abuse their [computer access] privileges, there is not much you can do with technical measures."

Courtney agreed, saying systems "do not seem to be under attack by technical giants." He said that of 1,293 computer-related fraud cases identified in the three years ending in mid-1983, only eight were perpetrated by programmers.

Courtney added that many inside computer crimes result from administrative personnel noticing that their mistakes are not caught. "The clerk who steals is often wholly controllable by making him see you are aware of what he does," he said.

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Sale of Drivers Lists Nets Michigan \$12.7 Million

By John Gallant
CW Staff

LANSING, Mich. — Whether or not they use their cars, the 6.5 million licensed drivers in this state get around quite a bit — at least in name.

The secretary of state's office here collected more than \$12.7 million last year by selling computerized lists with data about residents who hold licenses or who have motor vehicles registered with the state, according to Edward Boucher, a spokesman for the secretary of state. There are no restrictions on who can obtain those state lists, and the buyer is free to resell the information to others.

Almost 95% of the \$12.7 million, which is channeled to the Michigan Department of Transportation, was obtained through the sale of driving records to insurance companies. However, Boucher estimated that "at least a couple of hundred other companies" also purchased lists containing information maintained by the Motor Vehicle Division of the secretary of state's office.

"A person could be on any number of the lists we've sold," Boucher explained. "It just depends on how the buyer asked for the information, by what category it was sorted. Our records are quite sought-after because they're very up-to-date. The addresses and ages in the records are accurate because an individual has to update his automobile registration each year and his driver's license ev-

LANSING, Mich. — While there has been no great public outcry against the practice of selling computerized lists here, a spokesman for Michigan's secretary of state said problems arise when residents receive unsolicited mail they find offensive.

"About a year ago," according to Edward Boucher, "an insurance company in Texas bought a list of our registered drivers from another firm and mailed letters to everyone over age 55. That letter was very insulting, and it brought a flood of complaints to our office."

"Generally, though, this issue only comes up before an election, when the secretary of state's opponent tries to beat him over the head with it," he said.

Election time or not, Rep. David Evans (D-Mt. Clemens) is unhap-

py with the practice.

"It's basically a privacy issue," he said. "When a person gives his name and address to register a car or to get a driver's license, the secretary of state has no business selling that information to someone else."

Bill to Restrict Defeated

In a previous legislative session, Evans sponsored a bill that would have restricted the commercial use of the Department of State information. The bill failed to win approval; however, there is a possibility it will be reintroduced by another sponsor in the current session.

"We ran up against a lot of pressure from auto dealers who testified that these lists are their only source of information for automobile recalls," Evans said. "We held

a number of hearings on the issue, but the bill simply never made it out of committee. It died there."

According to Boucher, Secretary of State Richard H. Austin supported Evans' effort. "We're opposed to that type of commercial sale ... there's just no control," Boucher said. "I don't think it's a matter of secrecy, but people shouldn't be subjected to solicitation just because they have registered with us."

"One of the ironies," Boucher continued, "is that when a controversy arises about this, we get more calls from businesses looking for information. Some people get all worked up about it, but they never organize to change things. I guess people get so much junk mail already that they don't care."

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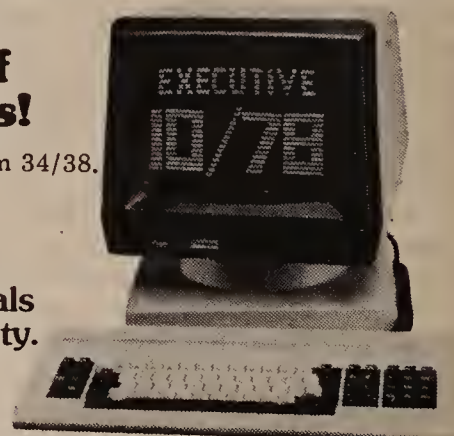
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OMB's Lack of Enforcement Cited

Report Slams Administration's Privacy Record

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. —

A recently issued congressional report sharply criticized the Reagan administration's record on privacy protection, calling it the worst since passage of the 1974 Privacy Act.

The report, released by the House Government Operations Committee early this month, declares that the Office of Management and Budget (OMB) under the Reagan presidency has failed to enforce the privacy law entrusted to it and has weakened government agency privacy guidelines.

"The Reagan administration has the worst record on privacy issues of any administration since passage of the Privacy Act," said Rep. Glenn English (D-Okla.),

commenting on the inquiry into the administration's enforcement of the law. English's Subcommittee on Government Information, Justice and Agriculture performed the study.

"Presidents Nixon, Ford and Carter showed at least some concern on privacy issues," said English, who added, "Now on the eve of 1984, there is no one in the Reagan administration with any interest in privacy. President Reagan talks about getting the government off the backs of the people, but I guess he just doesn't care if government snoops around in people's private lives."

OMB Singled Out

The study is particularly critical of the Privacy Act activities by OMB, which in a

June hearing on this subject admitted it does not monitor agency compliance with privacy guidelines [CW, June 13]. OMB also was accused of weakening its computer matching privacy guidelines under pressure from federal inspectors general without asking for public comments.

In addition, the House committee said, OMB failed to submit a required report on inconsistencies in privacy, confidentiality and disclosure laws due last April. And the Privacy Act annual reports submitted in 1981 and 1982 were incomplete, according to the study.

In general, the document stated, "Interest in the Privacy Act at the Office of Management and Budget has diminished steadily since 1974." Saying that "privacy interests frequently conflict with other important government interests, such as economy and efficiency," the report maintained that "there is a constant risk that privacy concerns will not be fully or fairly considered by federal agencies."

The committee recommended that OMB give privacy concerns higher priority and be more aggressive in monitoring agency compliance with the Privacy Act. "Congress should consider strengthening the role of the Office of Management and

Budget and should also consider alternatives to OMB as a privacy oversight agency," the report added.

The report also discusses international privacy issues and legislative proposals on privacy laws and practices and looks at 21 selected

agency records on Privacy Act matters. Titled "Who Cares About Privacy? Oversight of the Privacy Act of 1974 by the Office of Management and Budget and by the Congress," the study is available from the Government Printing Office.

Developers of Unix System Receive ACM's Top Honors

NEW YORK — Dr. Dennis M. Ritchie and Ken Thompson, members of Bell Laboratories' technical staff in Murray Hill, N.J., have received the Association for Computing Machinery's (ACM) 1983 Turing Award and the ACM Software System Award.

The awards were presented during the opening session of the ACM's annual conference here last month.

The Turing Award, which is the ACM's highest honor for technical achievement in computer science, was given to Ritchie and Thompson for "their development of generic operating systems theory and specifically for the implementation of the Unix operating system." The award includes a certificate and a cash prize of \$2,000.

The ACM Software System Award, which was established in 1983 to recognize systems that have had a lasting influence in concept or commercial practice, was also presented jointly to Ritchie and Thompson for their "creation and promulgation of the Unix system and the software components comprising a complete system."

The Unix operating time-sharing system was conceived by Thompson and developed jointly with Ritchie in the late 1960s.

According to the Turing Award selection committee, "The success of Unix stems from its tasteful selection of a few key ideas and their elegant implementation. The model of the Unix system has led a generation of software designers to new ways of thinking about programming. The genius of the Unix

system is its framework, which enables programmers to stand on the work of others."

Ritchie received a Ph.D. in applied mathematics from Harvard University and joined Bell Labs in 1968. Thompson received an M.S. degree in electrical engineering from the University of California at Berkeley.

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For User of Adabas, Natural

Conversion of Interface Solves Access Hangup

By Paul Gillin
CW Staff

PORTLAND, Ore. — The DP department at Evans Products Co., a manufacturing and retail firm based here, has found that Software AG of North America, Inc.'s Natural high-level programming language is ideal for most of its programming work. But until recently, the department was hamstrung by the fact that Natural could only access files on Software AG's Adabas data base management system or sequential files.

Many of the DP department's existing programs were designed to access Vsam or Isam files. With only about 10% of the programming time devoted to new development, a lot of work focused on "spiffing up, adding extras or making [existing programs] more user-friendly," according to Dian Odell, Evans' supervisor of technical services.

Natural was ideal for those quick jobs, Odell said. However, because of its limited file access capabilities, some programmers were shying away from taking advantage of it.

"There's a myth that if you use Adabas, you have to be big and smart," she remarked. "So some programmers were using Vsam files [and Cobol programs] because it's an easy transition from Isam." Switching Isam files to Adabas would be "a major development effort," but the switch to Vsam "was not a big deal."

Odell knew that Software AG was planning to unveil its Natural/Vsam access utility in the summer, but she decided to look elsewhere as well for solutions because, she said, Evans has often felt "abandoned" by Software AG when service or maintenance was needed. "We have found that if you run into a problem with Com-Plete or Adabas, you wait for a very long time for it to be solved and you don't get a lot of attention from the company," she said. "So that made us look twice at something coming from them."

A Software AG spokeswoman said service calls on severe problems are answered promptly, but that lesser problems are given lower priority. She said 60% of Evans' service calls since July 1 have been answered within two days.

Odell heard about Vsam Natural (Vnat), a product from MB & Associates of Aurora, Colo. Vnat is accessed through a standard CALL and associated parameter values that allows users to retrieve, add, replace, modify or delete Vsam records. In addition, Vnat was much cheaper than the comparable Software AG product — about \$1,500 compared with more than \$30,000 for Natural/Vsam, Odell said.

The problem was that Vnat was designed to work only under CICS, while Evans relied on Software AG's Com-Plete teleprocessing monitor

for most of its work. However, the department determined that it was worth the cost to bring in Vnat and modify it to run under Com-Plete.

"It turned out that in converting Vnat to run on Com-Plete, we also made it a more general product," Odell said.

The conversion involved rewriting the I/Os to make the product more general. "Once it was not CICS-specific, it became something that would work with Com-Plete or batch or TSO." MB & Associates performed some of its own modifications and later released the product as Vnatb, a general-purpose Natural/Vsam interface.

A major factor in the decision was Vnat's flexibility, Odell said. "Vnat can select records by specific key or generic key, can read files sequentially, can position you within a file via a LOCATE command and then read forward or backward from that point. Natural/Vsam didn't have that."

The enhanced Vnatb utility allows files to be opened automatically with no extra user CALL. Files can be read while they are under update control by another job, and a command is available to release the held record area left from an update so other users can get to it in inquiry mode, she said.

Since Vnat was installed, Natural's use has almost doubled, Odell said.

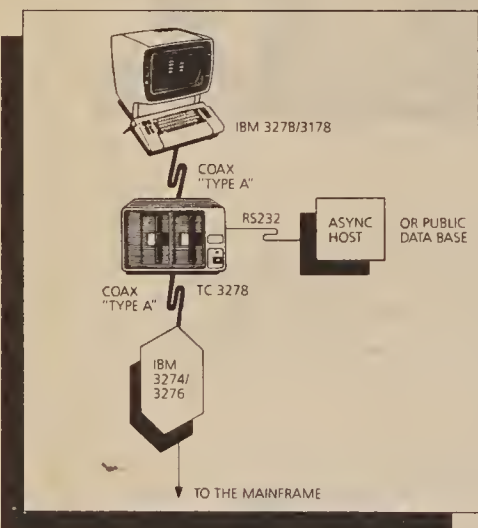
Vnat "opened up the option of using Natural and bringing all that power and productivity into the Vsam world. It started making Vsam a full partner to Adabas so that one access method could be chosen based specifically on what that could do for you rather than because it's the only one that lets you use Natural."

The installation came at an opportune time because "the new Natural release has a lot of power," Odell said. "This is enticing people to use Natural because they find they can get a system four to five times faster than in Cobol." She added that the DP department has only a handful of Isam data bases still in operation.



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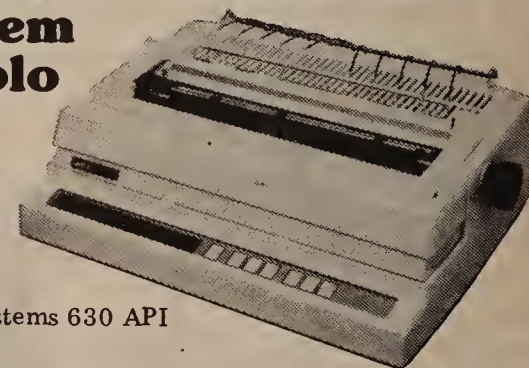
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House Approves Companion Bill

Senate Passage of Communications Bill Seen

By Phil Hirsch

CW Washington Bureau

WASHINGTON, D.C. —

There is an "excellent chance" the Senate will pass its pending telecommunications bill late in January, one knowledgeable observer said last week shortly after the House approved a companion bill.

Herbert N. Jasper, executive vice-president of the American Council for Competitive Telecommunications, a trade association of

other common carriers, added that Senate passage of its bill would lead quickly to conference committee consideration of both measures and resolution of differences between them.

The differences are significant but "not insuperable," Jasper pointed out. He believes Sen. Robert Packwood (R-Ore.), who will head the Senate conferees, is sympathetic to the House bill because it embodies a number of ideas in legislation that

Packwood introduced last summer; that measure, after being modified to gain majority support within the Senate Commerce Committee, became the pending Senate bill, S. 1660.

Brian Moir, Washington counsel for the International Communications Association (ICA), a users group composed of the country's largest companies, agreed with Jasper's estimate. ICA has opposed both the House and Senate bills. "Given the pre-

sent environment," he said, "it's unlikely S. 1660 won't pass the Senate. However, there may be some changes made on the floor." Regarding the overall outlook, Moir agreed that opponents of the two measures are on the defensive for the moment, although he regards a recent comment by the Reagan administration as a hopeful sign.

Shortly before the House voted on H.R. 4295 Nov. 10th, the Office of Management and Budget, in a letter to Congress, said the administration "strongly opposes" enactment of the bill because it "would encourage retention of inefficient cross-subsidies, would delay introduc-

tion of new equipment and services and would inhibit competition in the telecommunications marketplace."

The provision of H.R. 4295 that has aroused the greatest public controversy would bar the FCC from imposing a surcharge on residential and single-line business users of local telephone networks. These surcharges are part of a plan, unveiled by the commission last December, for changing the way local telephone companies are reimbursed for providing access to the interstate telephone network. The plan also underlies an AT&T tariff, which proposes big rate reductions for users of
(Continued on Page 18)

Life After 'Settlements' System

WASHINGTON, D.C. —

While the battle over national telecommunications policy simmers in the U.S. Congress, a closely related scuffle is under way at the Federal Communications Commission (FCC).

The key issue is what happens next Jan. 1 when, as a consequence of AT&T's divestiture, the "settlements" system ends. Settlements (see related story) presently pay local telephone companies some \$6.5 billion per year.

This money reimburses them for the interstate access facilities they provide. It also includes a hefty subsidy that reduces what users must pay for local and intrastate telephone network services.

Although the FCC's access charge plan would replace settlements with a system of flat monthly surcharges imposed directly on all local telephone subscribers and usage-based fees imposed on long-distance users through their interstate carriers, this plan has been deferred from the original start-up date of Jan. 1 to April 3. Thus, an interim reimbursement scheme is needed.

AT&T has proposed one that the Bell operating companies are willing to accept. Essentially, AT&T is offering to pay the operating companies the usage-based access charges specified in the FCC's plan, plus part of what the operating companies will lose through deferral of the end-user access surcharges.

While the FCC seems likely to go along with this plan, it is not clear that U.S. Federal Court Judge Harold Greene, who is presiding over AT&T's divestiture, will also agree.

In previous rulings, he has expressed strong opposition to the FCC's access charge ruling and might balk at endorsing the usage-based access charges the phone company has proposed.

But if Greene rejects

Analysis

AT&T's interim proposal, the FCC is likely to reconsider its three-month deferral of the access charge.

In the last two weeks, the commission has received several petitions requesting reconsideration. One, from the Department of Justice, said "the timely implementation of access charges is key ... to the efficient and effective implementation of [AT&T's divestiture]." The commission's three-month suspension "unnecessarily and inordinately complicates that process." Similar sentiments were expressed by

AT&T and the Bell regional companies.

These arguments have been undercut by the Bell operating companies' acceptance of AT&T's recent proposal.

If that offer is implemented, it would provide a way for AT&T to pay the operating companies for use of their local network facilities while enabling the FCC to defer start-up of its access charge plan until April. But if Greene shoots down the AT&T plan, a replacement will be needed very quickly.

One option would be for the FCC to cancel its three-month suspension of the access charge plan and put it into effect Jan. 1.

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Many Would Take Pay Cut for Growth

Career Growth Tops DPers' Desires: Survey

By Patricia Keefe
CW Staff

CHICAGO — Contrary to popular belief, data processing professionals are not necessarily for sale to the highest bidder.

In fact, many computer specialists will take a cut in pay in return for a position promising professional growth, according to two recent surveys of 6,720 job seekers conducted by General Employment Enterprises, Inc. (GEE).

GEE is a national employment recruiting firm with 44 offices across the country. It initiated the surveys to discover why people sought new jobs and to find out what was important in their job hunts.

Professional Growth Key

In the first survey, which focused on pay hikes vs. professional growth, GEE found that 41% of 317 currently employed DP professionals would be willing to accept a position providing an excellent career opportunity at the same pay level as their current salary. Another 21% went a step further and said they would be willing to accept the position at a lower salary than they now receive.

About 21% of the computer specialists responding had more than 10 years of experience, the rest had accrued from one to 10 years of experience.

Of those with 10 years of experi-

ence or less, 68.8% were found willing to take a position offering professional growth at the same salary or less. Similarly, 67% of those with more than 10 years of experience in their field put professional growth and career opportunity ahead of increased salary. The survey involved 3,270 people overall.

GEE's second survey — which involved 3,500 people, including 415 employed computer professionals — centered on job dissatisfaction. According to the survey, 43% of the computer specialists were looking

for new positions because they perceived limited opportunities for promotion in their present jobs. Many also felt their current employers underutilized their abilities.

Surprisingly, dissatisfaction with pay ranked only third among employed applicants, cited by 15% of those polled, according to GEE President Herbert F. Imhoff.

Imhoff advised employers to be sensitive to the way employees view their work and the advancement opportunities available to them, particularly in the case of engineering,

technical and data processing employees.

While "very few of these professionals said their companies lagged from a technology standpoint, they failed to see corresponding professional opportunities open to them," he said.

"This is an area in which an employer's human resources development efforts can have a dramatic impact on reducing turnover," Imhoff added.

GEE is headquartered at 150 S. Wacker Drive, Chicago, Ill. 60606.

Senate Approval of S. 1660 Bill Foreseen

(Continued from Page 17)

longer-distance, higher bit-rate services beginning early next year.

Currently, users of interstate services alone foot the bill for interstate access. A portion of what carriers collect for those services reimburses local telephone companies for providing the related facilities. These payments, technically known as "settlements," currently amount to about \$6.5 billion per year, they include a hefty subsidy that reduces the charges for local/intrastate services.

Under the FCC's new plan, beginning early next year, about one-third of that \$6.5 billion will be collected directly from all local telephone company subscribers in the form of a

monthly surcharge on each local loop. The charge will be \$2/month for residential subscribers and up to \$6/month for business subscribers. By 1989, approximately two-thirds of the costs assigned to local carriers' interstate access facilities will be collected through surcharges. (The remainder will be paid by interstate service users, indirectly, through their carriers).

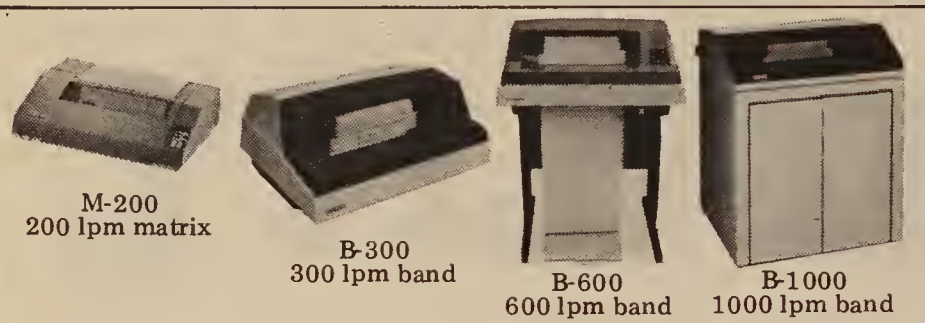
Supporters of H.R. 4295 oppose the FCC plan partly because it would force local telephone company customers who do not make interstate calls to help finance interstate access facilities; another objection is that the surcharges will destroy universal service.

Opponents of H.R. 4295, however, say that if long-distance rates do not come down, business communications users will migrate to bypass facilities, rates for the others will go up and universal service will be compromised. (To discourage bypass, the House bill requires users of alternate facilities to pay a monthly access charge of \$25/line termination. If the user certifies the circuit will not be used to bypass the local-exchange network the surcharge will be waived).

The other common carriers support the House bill mainly because it retains the existing differential between what they pay for access to the local networks and what AT&T pays.

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Many Students Start at 'Ground Zero' Firm's Personal Computing Classes Entice Users

By Patricia Keefe

CW Staff

LONG BEACH, Calif. — Training and outreach for end-user computing is not necessarily the responsibility of corporate DP departments. Nor are information centers the only viable solution.

The growth of end-user computing has spawned a diverse set of programs created to meet the needs of corporate micro users. The most innovative and encompassing programs are designed both to aid the second wave of micro users — those who are likely to resist automation — and to grow with the increasingly computer-literate and enthused first wave. Moreover, many of these programs are led by non-DPers who share the same work experience as their end-user peers.

One such model is about to enter its third year at the Arco Transportation Co. (ATC), where it is primarily directed at 450 home office employees in Long Beach, Calif. Ron Ellis, ATC's manager of systems development for the Information Services and Technology Department, estimates that 41% of those employees have gone through a voluntary introductory training program and have taken at least two of the 10 courses now offered. The introductory class is intended to make the staff aware of the possible applications for using microcomputers, Ellis said.

Many of these employees were at "ground zero" in terms of their exposure to computers, according to Ellis. "I think they see [the courses] as a good chance to get in touch with technology — a gentle way to get introduced to what's going on."

Interest in the program began in the clerical department and has moved part way up the corporate ladder. There is a need to aim training specifically at executives and middle managers who are primarily interested in the strategic applications of microcomputers, Ellis said.

The department is currently shaping two more courses: "Introduction to IBM" and an "Introduction to Microcomputers." "The focus is on the computer and how to make worthwhile use of it. We provide some word processing or editing capabilities to get them going," Ellis added.

Current course offerings include Visicorp's Visicalc software, spreadsheets and an introduction to Hewlett-Packard Co. — ATC has an HP 3000, a number of HP

125s and is experimenting with some HP 150s. There is also a growing number of Apple Computer, Inc. Lisas and IBM Personal Computers. All micro use is exclusively stand-alone, although Ellis admits to having "networking ambitions." There are 15 to 20 micros in use at ATC, a figure that Ellis predicted will grow substan-

tially in 1984.

Some 40 employees have progressed to the point of being able to develop their own applications. This in turn has helped to alleviate ATC's programming backlog and has increased the user's own productivity. Combined with the ability and willingness of some employees to teach eight of the 10 courses,

it has had the added benefit of considerably easing the pressure on ATC's DP staff of 15 and cutting training costs.

However, end-user computing also develops a need for applications and a support mechanism for those users who have progressed to developing their own applications, Ellis said. ATC handles this in several ways.

One method is the development of microcomputer work groups to serve as consultants on various topics and to present a variety of applications.

A second method involves a formalized effort to appoint an "account manager" to serve as the "first line of terminal support" in various

(Continued on Page 20)

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End-User Departments Told to Do Their Own Training

SEATTLE — Both vendors and data processing departments in user organizations have sorely underestimated the need for end-user training. Therefore, much of the responsibility for training must lie with end-user departments, according to Bill Fly, a consultant with Microcomputer Support Group (MSG) here, specializing in education, training and support for small computers.

"It is important to push this responsibility on the end-user departments, particularly in larger organizations," Fly noted. However, he also stressed the importance of management information systems involvement in this area. In Fly's experience, training efforts are typically hampered by:

- Buyers who expected equipment to be user-friendly — something Fly asserted is rarely the case. As a result, the equipment is not used. In this case, Fly provides what he calls starter classes — providing product-specific training.

- Buyers who have no realization of how much training will be necessary.

- DP departments that lack the willingness, staff or

resources to provide end-user outreach for microcomputer applications. "They are often struggling to keep up with the needs of the big systems," he said.

- Manufacturers who do not have the facilities in which to provide training.

One solution to end-user training is developing what Fly calls the "computerist" — an employee who will serve as a computing re-

source and provide training for others. "Many companies haven't thought through the problem of who is going to help others," he said, adding, "You have to have a micro support person — particularly in large companies."

The consultant also advocated forming microcomputer support groups. In addition to providing applications support, the groups can deal with sellers

to develop and negotiate contracts, Fly suggested.

"In this way, you can spread [microcomputer-related] experience slowly throughout the company," Fly said. This is important because there are not enough DP resources in most firms to allow one-to-one counseling for frustrated users, he added. An important goal, therefore, is to prevent end users from depending too much

on the DP department.

The consultant also lamented the unwillingness of many corporate training departments to get involved with end-user training. "Many avoid training on computers because they think it's too technical or too difficult for them," Fly said. He urged a merger of the "people who train and set up classes and the people who put together micro groups."

Micro Classes Stimulate End Users

(Continued from Page 19) end-user departments. "The account manager accepts the responsibility to help manage the problem of providing DP services to the user by providing logons, controlling the proliferation of files, conducting file purges and keeping track of what is going on," Ellis explained.

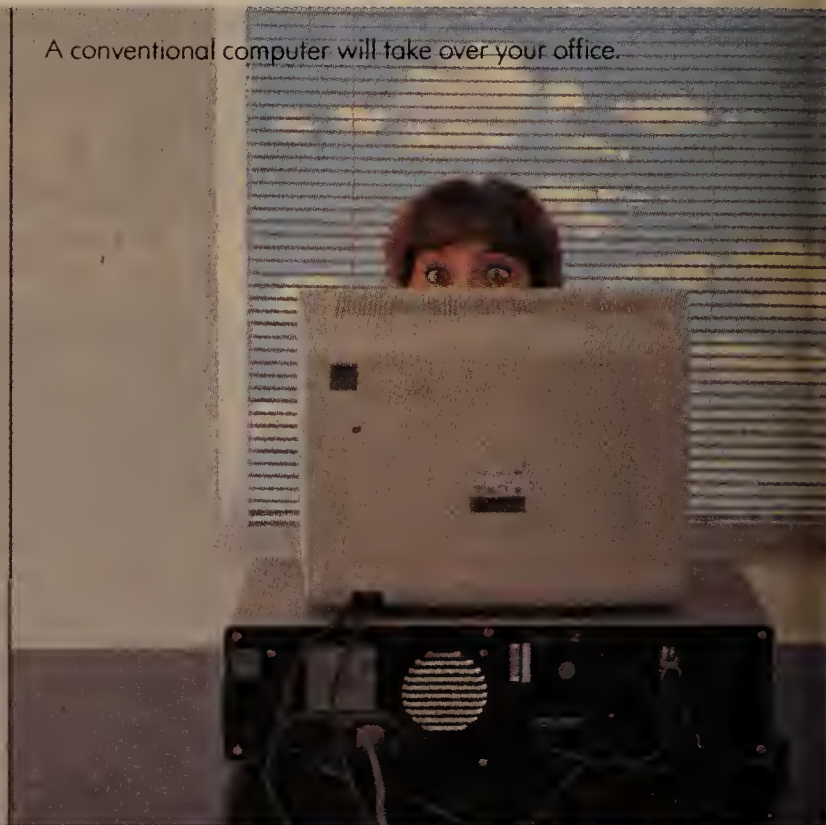
However, he emphasized that these managers are not experts. Users developing applications are likely to turn to their last instructor or their micro work group for support. The evolution of the work groups and account managers reflects users' acceptance that they need a level of service that the systems staff is not able to provide, Ellis said.

ATC is somewhat unusual in that it does not offer an information center, a popular route to end-user training in recent years. The problem is staffing, according to Ellis, who hopes to develop an "information center-like function" supported with dedicated staffing. Also in the works is development of a corporate microcomputer purchasing policy designed to limit microcomputer purchases to those that the DP department can support.

A conventional portable computer isn't so portable.



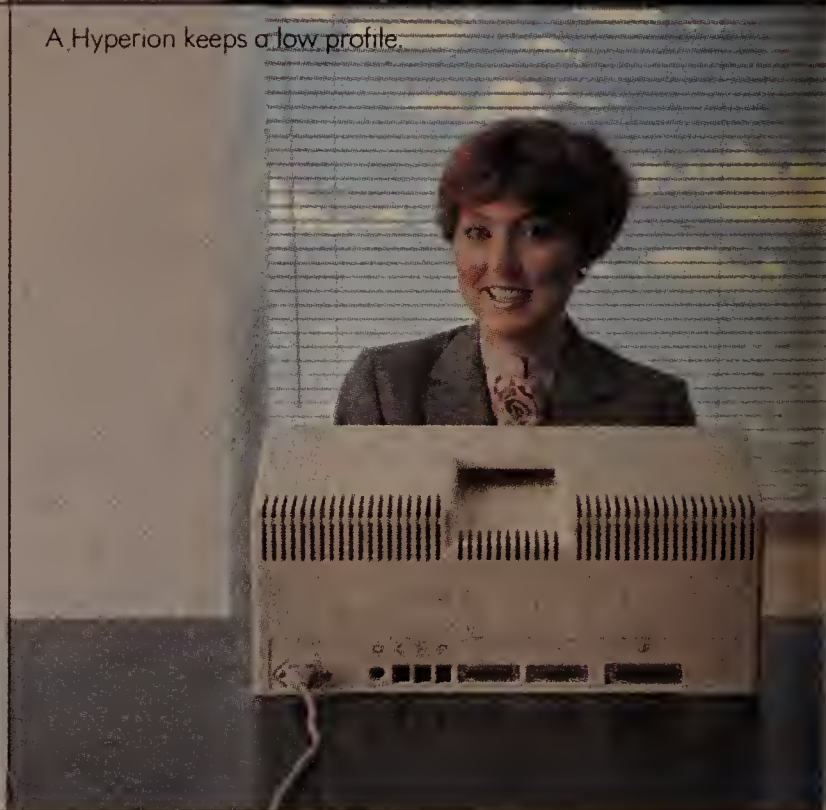
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Human Aspects of Managing Change Urged

By Robert Batt

CW West Coast Bureau

SAN FRANCISCO — The traditional role of the data processing manager needs to be expanded beyond its technical limitations to encompass the human aspects of managing change, according to an industry consultant specializing in organizational development.

In a paper presented at a seminar on "Managing the

Human Aspects of Technological Change" sponsored by his firm here last week, Daryl Conner, president of O.D. Resources, Inc., an Atlanta-based company, said the role for today's management information systems (MIS) department is not only to tend to the technical issues of automated systems but also to help integrate these technologies into the complexities of the work envi-

ronment.

One of the more important issues that must be dealt with in managing human reactions to technological change, Conner said, is to build enough commitment to the new technology to ensure that support will be sustained throughout the implementation period and into full utilization of the system.

Connor identified three parties to technological

change:

- The change sponsor — the individual or group that legitimizes the introduction of technology.

- The change agent — the individual or group that is responsible for implementing the technology.

- The change target — the individual or group that must use the new technology.

"The most prevalent fac-

tor contributing to failed change projects is a lack of commitment by the people in these central roles. If an organization is involved in major technological change that significantly disrupts the standard operating patterns, high levels of commitment from all three roles are essential," he asserted.

Speaking at the same seminar, Wayne DeBow, senior staff consultant at O.D. Resources, said that people will not adapt to technological change unless they perceive the need to change personally.

"It is not enough for DP managers simply to appeal to the need for the organization to change or assume a new level of technological competence. Being creatures of habit, employees fear and resist change that disrupts the way things have always been done. It is not really the technology they oppose as much as the way the technology changes their lives," he contended.

For a DP manager to manage technological change successfully, DeBow claimed, requires a clear vision of where the organization is now and where it is going; knowledge of the existing dangers and opportunities; and a strategy that will reduce dangers and increase opportunities.

On this last point, DeBow urged DP and human resource managers to include all levels of the organization in planning tech change.

It does not pay, he suggested, to attempt to hide the amount of disruption that will occur. "As long as disruption doesn't cause total mayhem, beginning it early, although painful in the short run, can accelerate a person's ability to adapt to that change," he added.

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Understand What Is in Writing

Negotiations Can Spell Out Successful Systems

By Lynn Haber
CW Staff

FRAMINGHAM, Mass. — The purchase of a computer system involves more than just a sale. It also represents the art of negotiation between buyer and vendor to come up with a contract that spells out a successful system.

"The art of negotiation is to determine what's important, what's possible and then get it. There are cost considerations and risk considerations reflected in the standard form contract from the vendor. So you negotiate what's possible for you, the buyer, and to the extent that you may want more, you may have to give to

get," attorney James Marcellino from the Boston-based law firm of Gaston Snow & Ely Bartlett said during a recent telephone interview.

Multiple contracts may be involved in buying a complete system, he noted. The overall purchase could include a software contract, a hardware contract, a software maintenance contract and possibly a fifth contract for programming services. To make matters even more difficult, there are different considerations for each type of contract depending on the particular situation, he pointed out.

In essence, you will be handed a

standard contract by the vendor, which it has drafted and which certainly puts the vendor in the strongest position. But, "almost every contract is negotiable," David A. Anderson, senior consultant for Verbit & Co. of Bala-Cynwyd, Pa., told *Computerworld*.

A basic premise that buyers must understand is that what is in writing becomes important. "Invariably, almost without exception, the writing will govern the legal relationship between the parties," Marcellino said.

The degree to which a contract can be negotiated involves many elements, including vendor and buyer flexibility, the status of a particular

business within the business community, competition in the market and the willingness of the buyer or vendor to assume monetary risk.

"To the extent that you negotiate a good contract, I think it's reasonable to expect that the vendor may ask for more money because he takes more risk."

(Continued on Page 23)

Four Pitfalls Await Firms Planning Micros

By Tom Henkel
CW Staff

BOSTON — Four major pitfalls await corporations planning to install microcomputers.

Speaking before users of small to medium-size IBM systems at the New England Systems users group here recently, Ted Kaplan, president of The Boston Center for Computer Applications, a consulting firm that deals in corporate microcomputer use, said the most common problems in installing micros include:

- **Defining a need for micros.** Kaplan said many companies decide to install microcomputers without really identifying a need for them. When this happens, micros tend to be used as executive toys or as "a solution looking for a problem," Kaplan noted.

- **Audit control is another headache.** In their haste to give employees microcomputers, many firms fail to evaluate who will be using the processors for how long and for what purposes. The result is a segment of a company's work force performing work that cannot be traced. That work can also be easily lost through theft or a natural disaster, Kaplan said.

- **A lack of consistency in corporate-wide microcomputer use is a companion problem with the lack of audit control.** Often, principally in large corporations, several departments wind up duplicating efforts in developing microcomputer software or micro-to-mainframe links. The result is usually several microcomputer systems that cannot communicate with each other, according to Kaplan.

- **Unrestrained growth of corporate microcomputers presents its own problems.** Often, various departments "sneak [micros] through on their budgets," Kaplan said. As with the lack of consistency, the unrestrained growth of microcomputers breeds incompatibility.

The solution to these problems, Kaplan said, is to develop a strong central authority that governs corporate-wide micro purchases. Whether the authority is one person or a committee, it should force various departments to cost-justify each microcomputer purchase.

In addition, the authority must also govern training and support for microcomputers, as well as standardize operation procedures and report formats, Kaplan said.

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Computer Contracts: Getting the Right Perspectives

FRAMINGHAM, Mass. — A contract can be approached from more than one perspective.

David A. Anderson, senior consultant with Verbit & Co. of Bala-Cynwyd, Pa., and attorney James J. Marcellino from the Boston-based law firm of Gaston Snow & Ely Bartlett suggested that a potential buyer should understand the following aspects of a computer contract.

• **Technical** — "You should address the details of the products and services that are being supplied," Anderson said. The buyer should obtain a list of all equipment, including serial numbers, model numbers and descriptions and manufacturer's specifications. "In fact, whenever there's a re-

quest for proposal [RFP] or any type of literature involved, that too should be incorporated into the contract," Anderson said. "You really want to be able to get down to detail."

Detail on the operating system and the utilities present should accompany information on software involved. A buyer should also look for documentation on both the program and system, screen layouts, report formats, program listings and user's instructions.

• **Financial** — "What we're talking about here is what kind of money is involved and how payments will be made," Anderson said. While there is no fixed formula, a vendor commonly expects a certain percentage

as a down payment, a certain amount upon specification approval and a payment upon delivery and acceptance of the entire system.

Anderson recommended holding back the amount of the payment that represents the vendor's profit until the purchaser is certain that all the loose ends are tied up.

Another aspect of negotiating financial matters pertains to cancellations. "You really don't want a nonrefundable down payment because that means that if you cancel tomorrow, you're out some big bucks," Anderson said. The purchaser wants an agreement that allows the vendor to be paid for the costs he incurred until the time of the cancellation. "Nobody should ever profit from a cancellation," he said.

• **Administrative** — This area includes items such as an implementation schedule, training and information about warranties. All organizations involved, including installation and maintenance, should be identified. The buyer should also know how to go about invoking penalty clauses and how to cancel the contract.

• **Legal** — This area covers the purely legal aspects of the contract including what kind of courts have jurisdiction, how disputes are settled and the types of protection afforded by patents, copyrights and trade secrets.

Some additional, simple techniques Marcellino suggested the user follow include negotiating a set period of time in which the buyer can operate the machine while maintaining the option of rejecting the product if it does not perform up to a standard.

"I think the nature of negotiation is changing because of increased competi-

tion, and I think you can negotiate performance standards that include a window, where in effect you can reject [the product]," Marcellino said.

"The contract should solidify that the system being purchased works in the way the parties had in mind, and what they had in mind should be in writing," Anderson concluded.

What Is Involved In a System Contract

(Continued from Page 22)

So a fundamental question to be considered is — Does the buyer want a good contract or does the buyer want the machine at the price at which it is being offered? "The price at which a system is being offered generally reflects the allocation of risk that's reflected in the contract," Marcellino said.

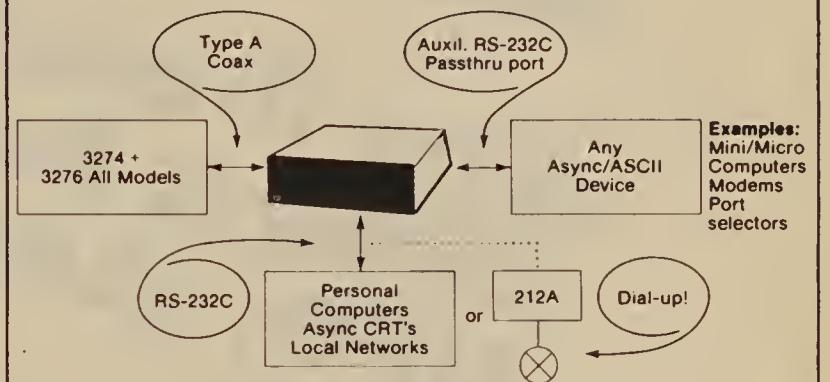
In addition to seeking legal advice in negotiating the contract, the potential purchaser should also obtain the expertise of a technical professional.

"Depending on economics, it is always advisable to have a technical expert advising the user," Marcellino said. "In the long run both the user and vendor profit from that," he maintained. The user's expectations often exceed the ability of the vendor to deliver. And there is always the risk that something will be oversold by the vendor, he continued.

"To the extent you get an expert in there to counsel the user realistically, you get a more realistic assessment of

the capabilities of the machine and someone on the user's side who can assess what the vendor can deliver. You avoid the risk that the vendor will try to oversell, and you avoid the risk that you're going to have an unhappy user. That same expert can assist a lawyer in assessing whether the contract itself reflects the understandings that are finally arrived at."

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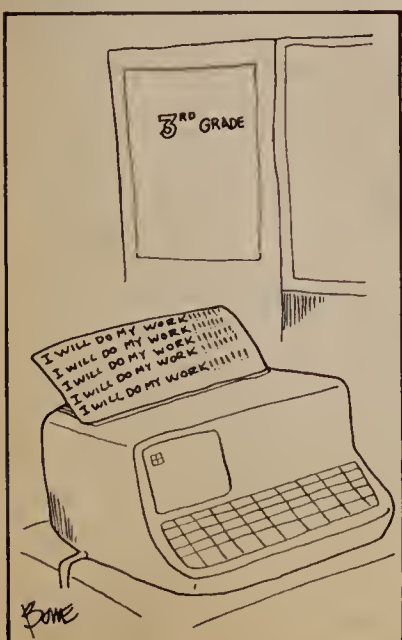
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As Computer Literacy Increases

Danger of Electronic Theft Seen Escalating

By Paul Gillin

CW Staff

RESTON, Va. — Stephen Leibholz likes to recall the time a New York bank challenged him to break the security features on one of its automatic teller machines (ATM).

Working with a special ATM filled with fake money, Leibholz and a partner tapped into the telephone line between the ATM at the bank's mainframe, recorded the code being exchanged between the two, deciphered the protocol and emptied the machine of \$80,000 within a half hour.

The experiment is only one example of the poor computer security measures many institutions employ, Leibholz said in a recent interview. "Every working day, electronic funds transfers [EFT] around the world total \$600 billion, \$400 billion in the U.S. alone," he said. "But probably less than two percent of the users who are vulnerable to penetration have anything beyond password security."

Not surprisingly, Leibholz has an interest in pointing out the shortcomings of conventional computer security measures. His company, Analytics Communications Systems, markets a data encryption and authentication device that is claimed to eliminate the possibility of computer crime in dial-up, dedicated and multidrop systems. Called Sherlock, the device incorporates a solid-state "key" with control and memory chips and a random key generator that produces encrypted code that can only be unscrambled by a Sherlock using similar keys. New codes are used for every communications session and are validated twice, he said.

A Growing Problem

Estimates of how much money is pirated from corporate data bases every year varies between \$1.5 and \$3 billion, but it is clear that the problem is growing, Leibholz said. As people in general become more computer literate and microcomputers continue to proliferate, the danger of electronic theft has become even more pronounced, he said.

Currently, three primary barriers exist to the use of more sophisticated security facilities in most businesses, he said. The first is the "It can't happen to me" syndrome. The second is the attitude put forth by many vendors that the problem can be avoided by carefully screening employees.

A third and dangerous

'Estimates of how much money is pirated from corporate data bases every year varies between \$1.5 billion and \$3 billion [and] ... as people in general become more computer literate and microcomputers continue to proliferate, the danger of electronic theft has become even more pronounced.'

problem is the perception that computer thieves are not really stealing, he said. "People equate hacking to stealing bananas from a pushcart," he said. "After all, you're just putting wires together, you're not really stealing anything."

However, experience indicates that even companies with "reliable" employees and extensive password security are victimized by computer thieves. Furthermore, figures reveal that the average computer crime nets about \$650,000, while bank robbers get away with an average of \$9,000. And hacking incidents that have come to light in recent months have pointed out that computer crime is still treated lightly by the courts. Only 21 states have specific laws dealing

with the issue, he said.

An archaic reliance on password security is at the heart of the problem in most companies, Leibholz indicated. "The majority of computer crimes since 1972 have involved penetrating passwords. That's how weak they are," he said. Passwords can be dug out of wastebaskets and desk drawers or even deciphered from recordings of communications between computers, he said. In addition, hackers have compiled lists of some of the most common verbal keys ("Snoopy" is a popular one).

The ultimate effect of passwords is to keep honest people out, he said. "They have a role in providing management discipline and protecting the system from mistakes, but they don't provide security protection."

Encryption devices, such as those being offered by Analytics, Motorola, Inc. and Racal-Milgo, Inc., are becoming an increasingly popular alternative, Leibholz stated. The National Bureau of Standards has issued a Data Encryption Standard and the American National Standards Institution has authorized a data encryption algorithm to compute a Message Authentication Code (MAC). Between parties that share a secret key, the MAC identifies the sender to the recipient

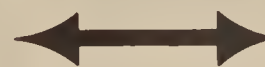
and assures that the received data is unaltered. MAC also makes it possible to establish an audit trail back to the originator of a transaction.

With bank-at-home and shop-at-home technology emerging and ATM and EFT use expanding in the future, protection devices "will be

as important as terminals themselves," Leibholz predicted. He noted that national and international funds transfer capabilities have magnified the potential for abuse. "You can now transfer money to a bank in Brazil and be gone from the face of the earth before the auditors even know about it," he said.

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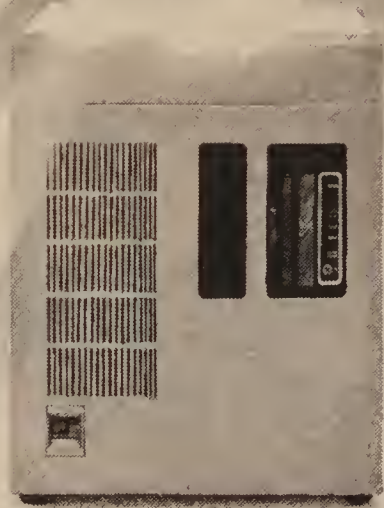
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Retailer Keeps Data Finger on Fashion Pulse

By Peter Bartolik
CW Staff

RIVERSIDE, Calif. — A firm specializing in merchandise planning from its headquarters here has an electronic finger on the pulse of the nation's fashion industry.

Retail Merchandising Service Automation, Inc. (RMSA) serves some 4,500 retail clients and locations in each of the 50 states. Vernon J. Rossi, president, chairman and founder of the company, recalled recently that the company became involved with computers in the mid-1960s because its customers were dealing with computers.

The company got its start here 27 years ago, providing merchandise planning consultation to apparel stores. In the mid-60s, according to Rossi, computer printouts started to show up in the material received from clients. "We decided that if computers were a way of life with retailers, we'd better find out what they were all about," he said.

Rossi said he hired top-notch programmers from IBM and "lived with them for three years" to teach them all about the retailing business. The programmers, in turn, automated RMSA's operations, which had been completely manual.

"Most of our operation is batch," according to Gordon Schoof, vice-president of the company. But communications capabilities have brought changes to the company and will continue to do so, he added.

RMSA tracks every piece of merchandise that goes through its customers' hands by coded tags attached to the item that identify it to RMSA's IPL Systems, Inc. 4436, equipped with a 4M-byte memory. While most tags are still shipped to the company's headquarters, more and more stores are now equipped with Telxon Corp. optical readers that read the identifying code and transmit the data over dial-up telephone lines.

According to Schoof, the stores communicate the data directly into the mainframe, and in some cases the mainframe communicates with mini-computers in the field. "We're in the process of developing a program for communicating with microcomput-

ers," Schoof said, adding that he believes micros will be an increasingly important factor in retail operations.

A recent survey of 922 clients, according to Rossi, showed 21.8% of the respondents were interested in obtaining computers, 70.1% were not interested and 8.1% already owned computers. "The bulk of stores below \$10 million in annual volume fit this pattern, over that, the results would be completely reversed," Rossi said.

While many stores produce inventory control numbers from the flow of goods, they are not so well equipped in developing strategies from those numbers, according to RMSA's executives. "There is no

magic in processing data; it's just that we have succeeded in making applications for handling a lot of data to produce results with people on the other end who are not necessarily [technically] sophisticated," Schoof said.

Rossi said the company prepares weekly unit management reports — analyzing every item every week — and monthly planning reports that are used by RMSA's 112 analysts in 26 field offices to advise buyers and planners on items that should be purchased; when they should be purchased and in what quantities; and even when particular goods should be marked down. According to

Schoof, "The magic of the fashion business is to have the right thing at the right time."

The company, which is presently converting from tape to disk, "has more classification information than the Department of Commerce," Rossi boasted.

RMSA not only can answer a client's inquiry, but can provide manufacturers with trending patterns on how well their items are selling.

In the DP operation, the company has two directors, one for transmission and one for day-to-day operations; seven senior programmers; 11 computer operators; and 22 checkers in the control department.



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Second Edition Of Directory Out for Pick

SAN DIEGO — International Database Management Association, Inc. (IDBMA) has released the second edition of *Directory of Application Software* for users of Pick and Associates, Inc.'s Pick operating system-based computers.

The IDBMA is the sponsor of the annual "Pick Spectrum" conference and trade show. The text they produced is said to list 211 individual application packages offered by some 70 companies in 48 classifications.

The directory is available for \$30 from IDBMA, which can be reached at Suite 210, 9740 Appaloosa Road, San Diego, Calif. 92131.

Forum Established to Discuss Transborder Ties

By Peter Bartolik
CW Staff

ATLANTA — Taking a portable microcomputer overseas may present some problems, and using that device to access U.S. data bases may be all but impossible for a traveler.

In an effort to solve these problems or at least provide a forum for their discussion, an electronic file is being established for businessmen to share successful and unsuccessful transborder access attempts.

Called Project Easylog, the file is designed to be used by executives who use portable micros on foreign travel to report and share their experiences logging on to any data bases in the U.S. The file was recently an-

nounced by Conway Data, Inc. and Conway Publications, Inc. and is available free on the firm's Sitenet data base, established earlier this year [CW, July 18]. Sitenet, also a no-charge information service, focuses on industrial and economic development opportunities.

Basically, the information collected via Project Easylog will be used to persuade officials of various nations to improve or introduce procedures for easy link-ups between microcomputer users with overseas data bases, according to McKinley Conway, head of Conway Data and director of the Industrial Development Research Council in Atlanta.

"In general, those who have attempted to carry a portable computer

to other countries and use it via modems and telephones to contact their offices or read on-line data bases in the U.S. have found nothing but disappointment and frustration," Conway said.

Often, portable microcomputer users are required to obtain special permits to carry their machines abroad or face delays by sending micros ahead, Conway stated. As an example, he noted a three-month delay he experienced when sending a micro to a staffer in New Zealand.

"Once you get your machine to another country, you probably won't be able to use it to link with the U.S. without getting specific approval from the government telecommunications office," he added. "That may

take some time and involve substantial fees."

Conway's organization has mailed questionnaires to overseas postal telephone and telegraph agencies, which regulate communications in their respective countries, in an attempt to determine established transborder micro communications procedures and to spur the establishment of ease of access.

"Ease of accessing data bases in the U.S. is becoming a consideration in the location of new investment in less developed nations," Conway said at the launching of the project. Information on accessing Sitenet and the Easylog file can be obtained from Conway Data, 1954 Airport Road, N.E., Atlanta, Ga. 30341.

Communications Main Topic At Pacific Meet

HONOLULU — PTC '83, the sixth annual conference of the Pacific Telecommunications Council, will convene here Jan. 8-11.

The principal topic for discussion at this year's event will be basic telecommunications needs in the Pacific hemisphere, according to sponsors at the PTC. The conference will be structured to identify basic telecommunications needs, discuss technical and institutional responses to those needs and examine relevant issues and policy considerations to resolve those needs.

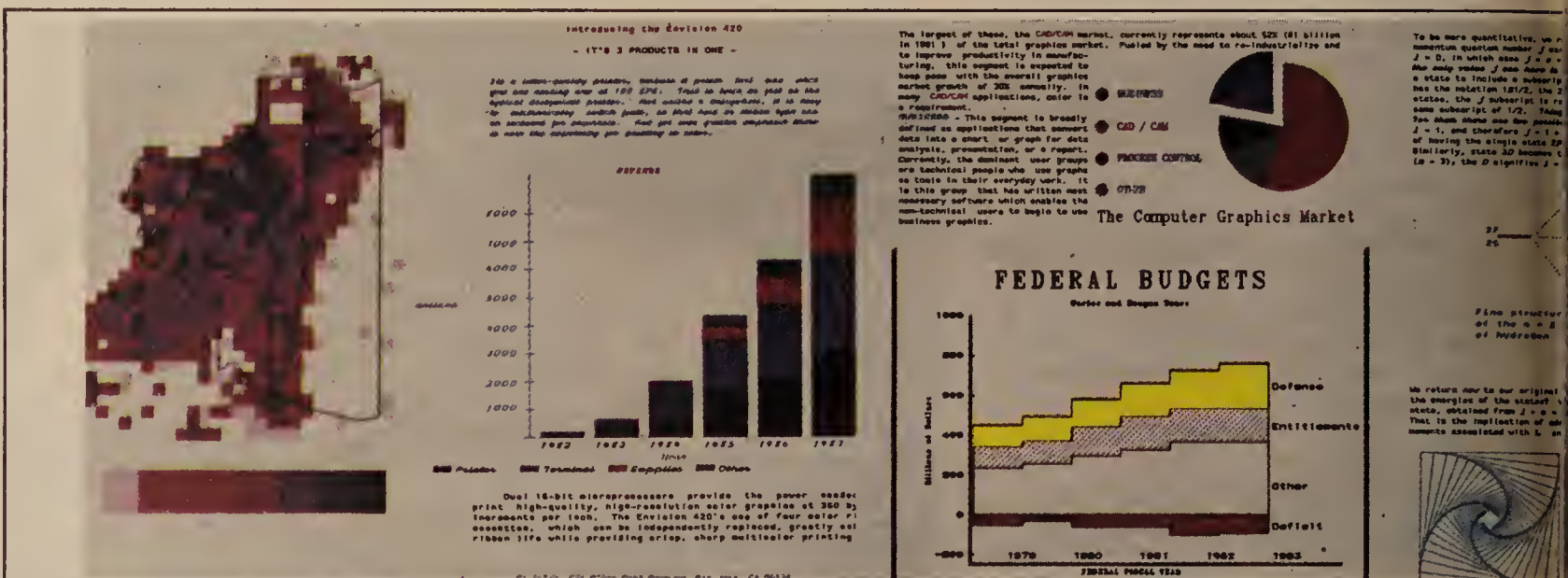
On the platform to address this subject will be Armando Vargas, Minister of Information and Communication for the Republic of Costa Rica; Lionel Olmer, undersecretary for international trade with the U.S. Department of Commerce; Tetsuro Tomita, deputy director-general of the Telecommunications Policy Bureau in the Ministry of Posts and Telecommunications, Japan; Basil Beneteau, vice-chairman of Northern Telecom, Ltd.; and J.H. Stevens, chairman of Canada Wire & Cable Co. Ltd. and international president of the Pacific Basin Economic Council.

The conference will also feature informal study groups, round tables and workshops.

The registration fee is \$375. Further details may be obtained from PTC headquarters at Suite 303, 1110 University Ave., Honolulu, Hawaii 96826.



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International Report

FROM THE CW INTERNATIONAL NEWS NETWORK

AUSTRALIA

MELBOURNE — In a deal worth approximately \$12 million, Rupert Murdoch's multinational newspaper conglomerate called News Ltd. has acquired a one-third interest in Computer Power Group. The agreement calls for News Ltd. to underwrite Computer Power's operations and finance a five-year master plan to build Computer Power into a \$100 million company, sources said. News Ltd.'s list of companies includes a score of newspapers — including the *Chicago Sun Times*, the *Boston Herald*, the *New York Post*, the *Star*, and the *London Times* — but this marks the company's first interest in a computer vendor.

RYDE — Following a significant drop-off in the personal computer market over the past few months, Apple Computer Australia Pty. Ltd. is terminating agreements with its 100 dealers here. Sources claimed Apple's distribution network has been fighting a losing battle for its market share, which dropped from about 27% in May to about 12% in October.

SYDNEY — Attache Software Pty. Ltd. is said to be posed for an attack on the North American microcomputer accounting software market. The company has raised a total of \$2.2 million in venture capital and has established an office in Michi-

gan. It launched its sales campaign during the National Software Show in San Francisco last month and has since nailed down deals with Toshiba Ltd., Otrona Corp. and Wang Laboratories, Inc. Negotiations are now in the works to secure deals with other micro makers, one of which is rumored to be IBM.

MELBOURNE — The Australian Bank Employees Union has made a number of demands on Australian banks concerning the impact of technological change. The union wants to negotiate proposed technological implementations before they are introduced, a spokesman said. Specifically, the union wants to discuss

health and safety issues with respect to CRT display units and related equipment.

BRAZIL

BRASILIA — IBM was again deflected in a second attempt to break into the Brazilian marketplace. Brazil's Special Department of Informatics rejected IBM's proposal to set up a showroom in Sao Paulo composed of bank terminals from a number of vendors. Earlier, IBM had been excluded from a Brazilian project calling for a distributed processing system, sources said.

RIO DE JANEIRO — Firmino Rocha De Freitas, the president of the Brazilian Association of the Electrical and Electronics Industry, claimed that private enterprise in Brazil is being ruined by lack of components, due to rigid import restrictions. Because companies are getting no imports, they are forced to halt production and shut down. According to De Freitas, the government has refused to give financially troubled companies enough money to continue production. In the meantime, the president of Brazil's Central Bank has reportedly assured De Freitas that by the end of November, Brazil's financial problems will begin to work themselves out.

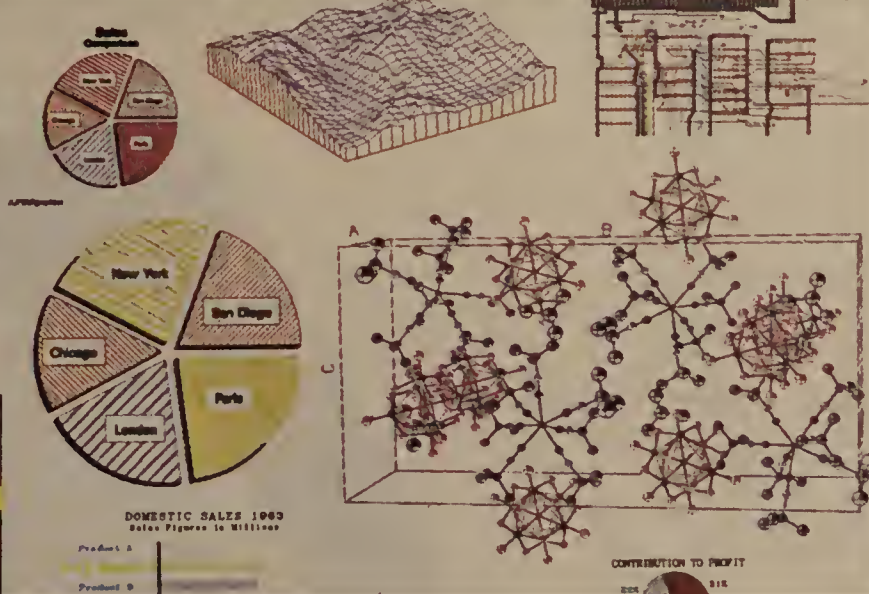
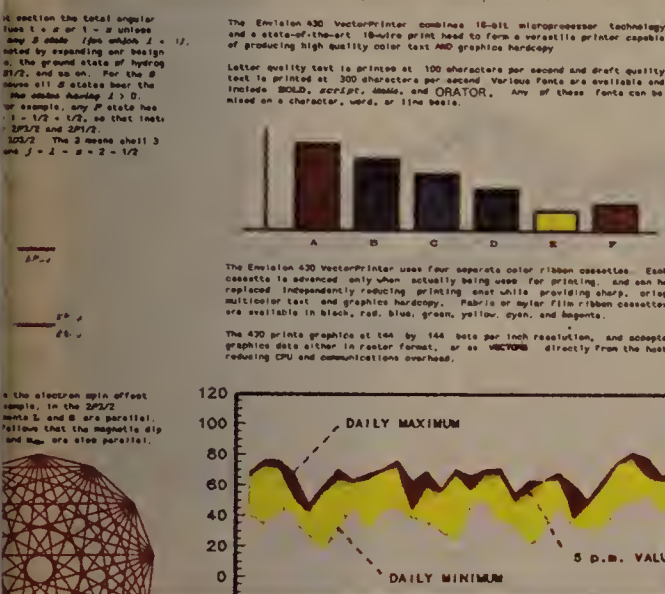
FRANCE

MONTE CARLO — At its recent European Users Group meeting, Culinet Software, Inc. demonstrated its relational data base management system IDMS/R and its line of personal computer software. The vendor demonstrated relational access capability to a central data base via a personal computer and a tool kit that integrates word processing, an electronic spreadsheet, graphics and communications capabilities.

PARIS — Bull-Sems, the minicomputer subsidiary of the French computer group Bull, is expected to announce three new models of its Mitra and Solar product lines: the Mitra 725, the Solar 16/35 and the Solar 16/90. The Mitra 725 is a high-end, 16-bit system dedicated to transactional applications and features cache memory and cache disk. The two Solar CPUs will be aimed at industrial environments. The Solar 16/35 is a 16-bit machine with 256K bytes of memory and a high-end bi-processor called the Solar/90.

JAPAN

TOKYO — Sony Corp. has unveiled a Cable Digital Audio/Data Electrical Transmission System (Cada). The product reportedly uses Japan's free channel on existing CATV and enables users to transmit and receive high-quality digital music, facsimile, software and various other data. Cada is an application of pulse code modulation technology, the vendor explained. The standard system for sending signals is priced at \$29,787, and the terminal costs \$213. The Cada system is scheduled to be available during the summer of 1984, a spokesman said.



can define up to 196 characters to print both text and graphics. And to add versatility to your text creations we made our 430 compatible with the Diablo 630 ECS. Which means it supports the most popular text and word processing packages.

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Another nice little benefit of our 430 you won't find in other color printers is a four-cartridge ribbon system. Our separate color cartridges advance independently as each color is used. By doing things this way you don't end up wasting ribbon or running out of the color you want just when you want it. It also means lower cost per copy for you. Plus you also have a choice of high quality mylar ribbon cartridges and longer life nylon ribbon.

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a print control microprocessor which tracks the carriage through a unique closed-loop servo system and adjusts for carriage speed and direction during dot placement. That permits it to print while the carriage accelerates. Which is another reason it gets your job done a lot faster.



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If you tear down our 430 you'll find two 16-bit microprocessors. One of them controls the printing mechanism; the other takes care of the host interface and command interpretation.

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Text and graphics samples courtesy of: ISSCO, Megatek, Molecular Structure Corporation, and Precision Visuals, Inc.

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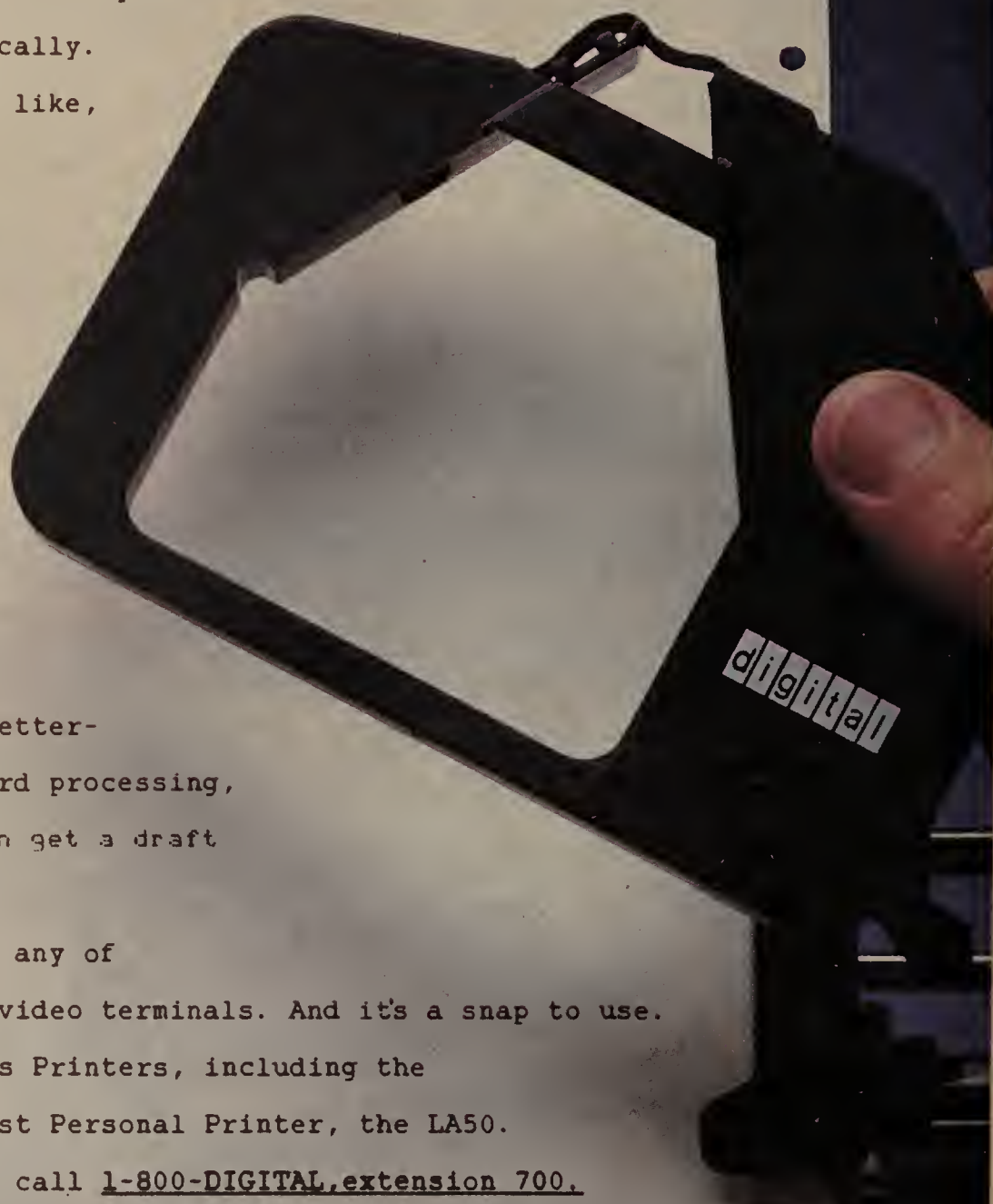
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digital

Computer Attendants Cut Parking Lot's Losses

NEWARK, N.J. — A computerized parking lot? That idea is not out of the question for a firm here that claims computerization can help parking companies cut down on losses and better manage facilities.

Maintaining that parking lot owners lose up to 20% of their revenue to employee theft and customer abuse of privileges, Steve Nislick, comptroller of Edison Parking, Inc. here said his firm spent four years working with Secom International, Inc. of Los Angeles to develop a system to control that revenue loss.

The firm recently completed development of what it claims is the first computerized control system for monthly parking suppliers that integrates access control with the debit and audit accounting functions of a standard business computer.

Dubbed the Computing-Recording-Auditing (CAR) System 1000, it was developed by Secom to Edison's specifications. The system reportedly includes entrance

and exit monitors, which are controlled by Intel Corp. 8080 microprocessors. The units are connected to a specialized central processor, which is also based on an Intel 8080.

The central processor handles accounting functions, Nislick said. The system uses the same optical scan technology Citibank of New York developed for its "Citicard" banking system — a technology licensed by Secom for nonbanking purposes, according to Nislick.

CAR System 1000 is currently used in five parking facilities in the U.S. These include the Hippodrome Building garage in Manhattan (with 250 monthly customers) and the Tower Place garage in Atlanta (with 1,993 monthly customers). The modular CAR System 1000 can accept additional memory to process up to 18,000 accounts, Nislick said. The system was originally developed for use within Edison, but the user firm is now willing to sell the system to other parking companies,

Nislick noted.

Each monthly customer receives a plastic card for entering and exiting the facility. Through an administrative terminal in the garage, the manager commands a central processing unit to link an optically coded 20-digit cipher number in the card to a specific, recognizable account number, according to Nislick.

To use the facility, the monthly customer must insert his card into an optical card reader. Before the system accepts the card and raises a gate arm, it first confirms the card's status (whether its account is paid) and mode (whether a vehicle is already using the facility through that card), Nislick said.

After a predetermined time period (typically the end of 30 days plus a grace period), the central processor unit cancels the authorization of an account for the upcoming month. The customer must at that time pay the amount due and have his card reauthorized for daily use, Nislick noted.

Another feature of the system is that it can selectively reject a card reported lost or stolen while maintaining the same customer account number. A substitute card with a different 20-digit cipher number is used at the facility. Once the new card is issued, the original lost or

stolen card becomes inoperable, Nislick explained.

"When the loss of a card is legitimate, we can replace it immediately, without the inconvenience of going back to the manufacturer," Nislick said. "However, every card must be authorized before it can operate the system, so no employee has access to floating inventory cards that can be abused."

CAR System 1000 was designed with intelligence at each optical card reader. Together with the central processing unit, the intelligent reader performs a five-step check calculation on the customer account number for each card inserted.

The system also makes it possible to hold the garage manager accountable for his actions.

DSS Software Meet To Feature MIS Topics

BOSTON — "Software Tools for Distributed Support Systems" is the title of a conference to be held here Feb. 27-28 at the Westin Hotel. The keynote speakers will be Peter G. W. Keen, chairman of Micro Mainframe, Inc., and Gary K. Gulden, vice-president of Index Systems, Inc., according to a spokesman for Suffolk University's School of Management, which is sponsoring the conference.

The conference will focus on the management issues of integrating microcomputers, telecommunications and decision support functions into the corporate mainframe environment.

A panel discussion on each day will include four users and consultants and the keynote speakers, according to the Suffolk University spokesman. Twelve software vendors will provide demonstrations and discussions of their products.

Registration costs \$495 for both days. More information

is available from Dr. Warren Briggs, The Software Tools Conference, Suffolk University, Boston, Mass. 02114.

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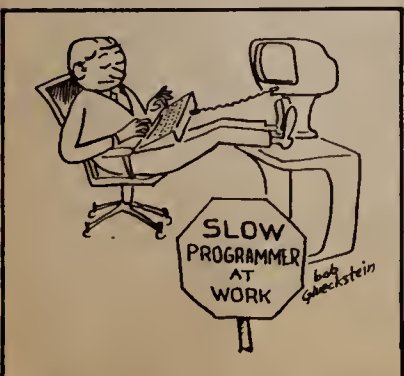
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Consolidation Cuts Costs, Raises Efficiency

BU Ties Itself Together With Standardized WP

BOSTON — Standardizing its word processing systems has helped decentralized Boston University (BU) tie itself together by cutting purchasing costs, increasing efficiency and ensuring equipment compatibility.

The school's 500 departments are spread throughout the city, rather than operating from a self-contained campus. Even the main nucleus of buildings is dissected by two major thoroughfares.

Because of its geographical characteristics, BU could easily have fallen into the decentralization trap — an abyss into which hundreds of thousands of dollars are poured to acquire various pieces of expensive, noncompatible equipment.

"That's exactly what was beginning to happen here three years ago," said Michael King, director of office technologies for BU. "All our departments had a need for word processing, but at that time, the good systems were extremely expensive." This turned out to be a cloud with a silver lining, according to King.

Although various vendors were approaching different departments individually, the high cost of word processors effectively limited the number and variety of systems purchased.

Problem Studied

However, there were fears that unless something was done, dozens of noncompatible systems would proliferate throughout the university. King was asked to study the problem. The more he investigated, the more convinced he became that standardization was not only desirable, but necessary.

"The advantages were obvious," King said. "Having one brand of word processor throughout the campus would not only facilitate communications between the word processors and our main computers, it would also reduce retraining efforts for transferred employees." Also, purchasing \$500,000 worth of equipment from one vendor, instead of \$50,000 worth from 10 different vendors, would give the school more financial clout, King added.

It was decided to go with one vendor, but which one? A wrong decision would prove very expensive. Wang Laboratories, Inc. was the recommendation after an extensive six-month study of available systems, including those from Digital Equipment Corp.; IBM; NBI, Inc.; and Micom Systems, Inc.

Now, more than two years after the initial purchase, BU has 20 Wang systems, ranging from a small stand-alone System 5 to several Wang OIS 140s, some of which are supporting a combination of 32 terminals and printers.

King believes that for a school the size of BU, automation is a necessity. "Take the admitting process alone," he said.

"Our Admissions Office generates over 60,000 letters annually to prospective students. Before automation, these had to be impersonal form letters. A personalized letter makes a much friendlier impression," he said. Word processing has allowed the School of Management to offer a resume cover letter service for its job-hunting graduates. And, word processors "have really taken the drudgery out of grant proposal writing," King added.

"We're finding new applications all the time," King said. These include using Wang's List Processing software in conjunction with the OIS system and automating the controller's refund logs.

In addition to freeing the main administrative computer from routine operations, some Wang systems have been adapted to communicate directly with the mainframe computer, greatly ex-

tending its usefulness. Wang 3271 Emulators have been added to some of the Wang systems on the campus, so operators of these systems can access (with authorization) all the data resident on the administration's IBM 3081 mainframe. They can call up this information on their screens and print it on their printers — performing the same functions as would separate IBM workstations.

"Another thing we've generally found," King continued, "is that many administrators throughout the university are saving a tremendous amount of time by typing their own text. Since mistakes are corrected easily, we don't have to be great typists. It's just as fast — sometimes faster — to do it ourselves on the word processor rather than write it out longhand for a secretary to type, or wait until a secretary is available to take dictation."

The amount of training necessary is minimal, according to King. "The documentation is excellent. It really leads you through the entire process. One can pick up the finer points from co-workers who may be more familiar with the systems." Another plus is the service Wang provides. Initially the school had problems with service not keeping pace with the

advancing technology, but now BU essentially has its own Wang technician resident on campus.

All in all, King said the university is very satisfied with Wang. "As new technologies are developed,"

King said, "we will go through the same investigative process to decide which vendors can best meet our particular needs. Wang is certainly one of the manufacturers whose new products we're watching closely."

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Computer Simulation System Lifts Boeing's Airliner Designs to Skies

RENTON, Wash. — Boeing Corp. engineers have taken their designs for new commercial airliners to the skies on scores of occasions without ever leaving the ground, thanks to a computer-based simulation system that has substantially reduced the need for costly flight testing.

Boeing's \$20 million Flight Simulation Center here is the most sophisticated engineering and flight simulation laboratory in the country, according to its manager, Calvin Phillips. Assisted by a bank of Harris Corp. superminicomputers and simulation software developed by Phillips' staff of 150 software and hardware engineers, the center has for three years played a major role in the design and testing of Boeing's new 757 and 767 airliners.

Emphasis at the facility here is on engineering flight simulation rather than on training flight simulation. Designers are allowed to ex-

periment with a number of flight variables that generally remain constant during training flight simulation.

Beyond Normal Testing

"With tools like simulation," Phillips said, "we are able to go considerably beyond the normal flight test during the design stage. We can carry the testing further than might be safe in a real airplane — at higher speeds or closer to the ground or in unusual flight altitudes or abnormal weather conditions."

Moreover, Phillips said, "We have estimated that simulation has offered us substantial cost savings over flight test, somewhere in the neighborhood of 100 to one. Capital costs for a simulator are less than for an airplane — you use no fuel, and fewer people are needed for 'flight' and maintenance. Where simulators cost hundreds of dollars an hour to operate, flight test in an airplane costs many thousands of dollars."

In addition, simulation enables Boeing designers to study only that part of flight affected by the performance of a given prototype. To test the autoland system, for example, engineers can simulate landings without first having to take off and land.

During an actual flight test, the design team might undertake only four or five landings an hour. But using simulation, the team can perform the exercise once every two to three minutes because the plane can be positioned for "landing" again at the touch of a button.

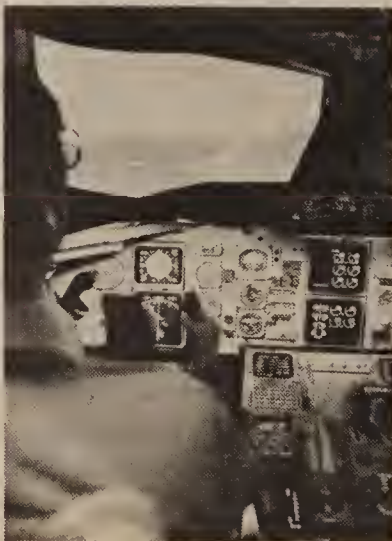
The staff here developed

the 757 and 767 simulation software and built the interfaces between the Harris computers and the flight deck systems. In addition, standard simulation models have been developed for all Boeing aircraft, including the 707, 727, 737 and 747.

The center has five simulation cabs and a computer-generated imagery (CGI) visual display system that can provide independent and simultaneous displays to any two of the cabs. The CGI system, which provides an out-the-window perspective, was jointly developed by Rediffusion Simulation, Inc. and Evans and Sutherland, Inc.

The majority of the simulation studies done in the laboratory are run on its 24 Harris superminis. Real-time tasks utilize five Harris Model H-800s, two Model H-100s and one Model S-200. Two additional Model H-800s are used for program development and interactive use. A Model H-100 supermini is used as a test system for hardware and software checkout, and 12 Model Slash 6-2 front-end processors are used for simulation tasks. A Harris S-200 and two Model H-100 systems are used in support of avionics hardware and integration checkout for the 757 and 767 programs.

Utilization of the simulation center here has grown by more than 1,000% since 1976, from approximately 3,600 hours of use per year to more than 42,000 now. The development of the 757 and 767 aircraft required significantly more simulation and more computing capacity than previous airplanes.



A simulator pilot approaches a runway in a C cab.

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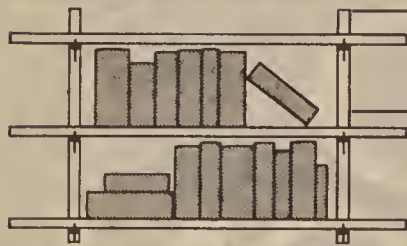
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TELEPHONY: TODAY AND TOMORROW

By Dimitris N. Chorafas

For a book covering so much, this 292-page paperback provides surprising technical detail, capability appraisal and market assessment of communications technologies. The subject is electronic switching systems, the great determiner of office efficiency, speed and reliability.

Telecommunications, that "necessary evil" in the eyes of corporate management a few years ago, now is viewed as a strategic tool. A typical manager spends 40% of his time involved with mail, the telephone and business travel. Writing and reading claim another 12% to 35% of the workweek. Obviously, any "communications" (computers and communications) advance that offers a faster, better and/or cheaper means of communications requires careful consideration.

This book clearly and interestingly presents the facts needed to understand and compare telecommunications options. Part 1 recounts the familiar technologies, such as message services, facsimile, private branch exchanges and the telephone. As the title implies, the ubiquitous telephone is emerging as the center of telecommunications today and tomorrow. Currently, 75% of calls made do not reach the desired person, and 50% are one-way — requests, orders, notifications.

Part 2 considers newer technologies, such as microwave, optical fiber and satellite systems. The major emphasis here goes to optical fibers, as significant in potential impact, the author believes, as the effect of large-scale integration on electronics.

Part 3 looks at how the old and new technologies will be connected through local-

area and value-added networks. Privacy issues close this book — an afterthought, perhaps, adding a little social perspective to an otherwise valuable nuts and bolts rendering of telecommunications.

Telephony: Today and Tomorrow carries a 1984 publication date, though at least one reference bears a 1983 stamp: AT&T Information Systems, Inc. appears in sev-

eral places as its short-lived predecessor, American Bell.

Cloth, 292 pages, \$19.95, ISBN 0-13-902700-9. Prentice-Hall, Inc., Englewood Cliffs, N.J. 07632.

MANAGEMENT SUPPORT SYSTEMS: A PRAGMATIC APPROACH

By Harry Katzan Jr.

Cast aside the familiar DP buzz phrase "decision support systems" (DSS). In its

Publishers wishing to have their books considered for review can direct books, prepublication galleys, press releases, catalogs or other information to George Harrar, Book Review Editor, Computerworld, P.O. Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

place, Katzan outlines management support systems, a

network that includes DSS, office information, modeling/simulation/optimization and data base systems, all of which enhance executive and administrative decision making.

Three important aspects of providing management support systems in a computer environment are: moving the data into position for accessing; creating an atmosphere where end users can

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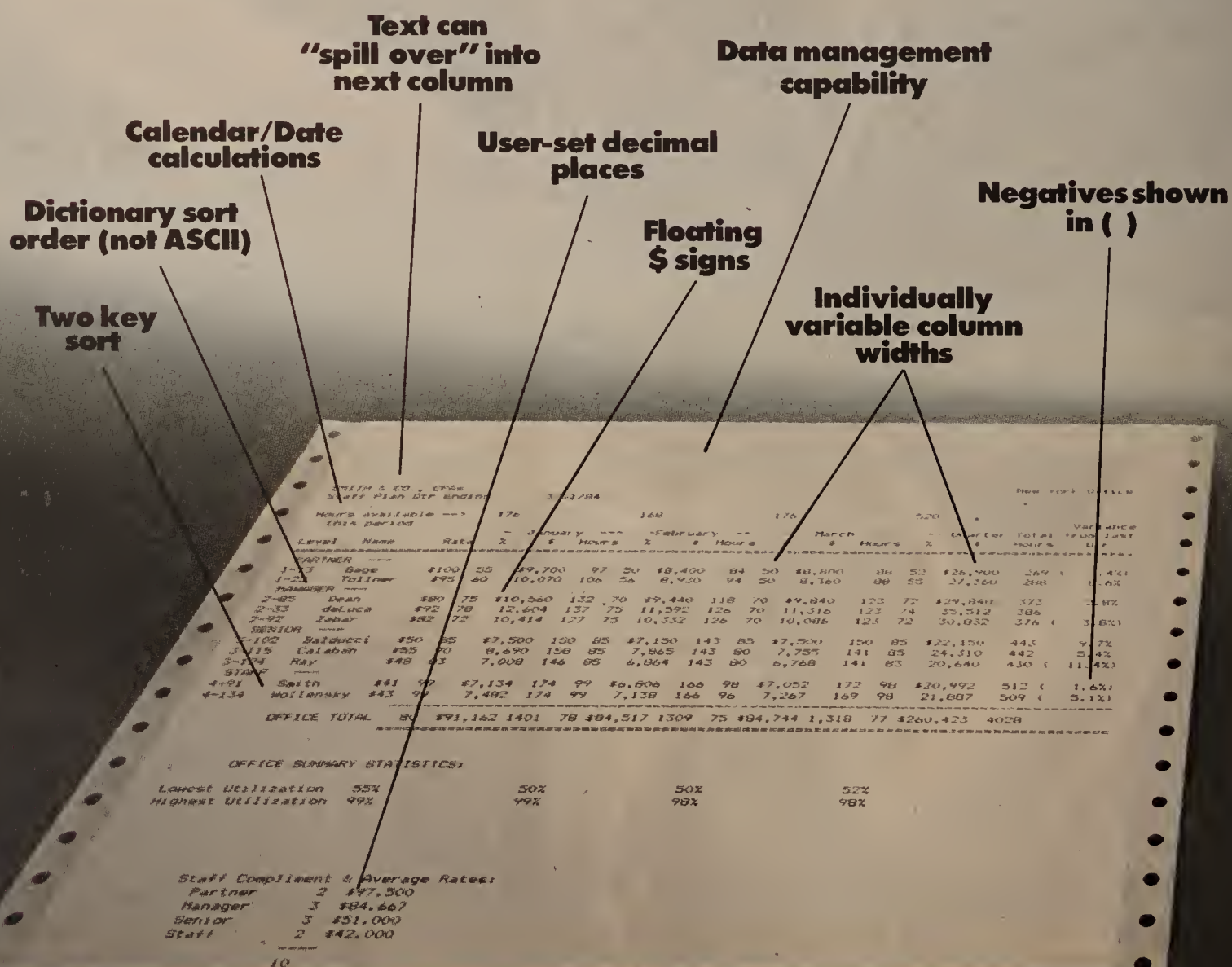
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Off the Press

take advantage of information services; and providing the right computer facilities to further decision making. This kind of support can reveal where the company stands now, where it is heading and what the best way is to get there.

One management support system envisioned employs artificial intelligence in a sophisticated question-and-answer process between two

people.

Hardcover, 128 pages, \$21.95, ISBN 0-442-24753-2. Van Nostrand Reinhold Co., 135 W. 50th St., New York, N.Y. 10020.

MANAGING HIGH-TECHNOLOGY COMPANIES

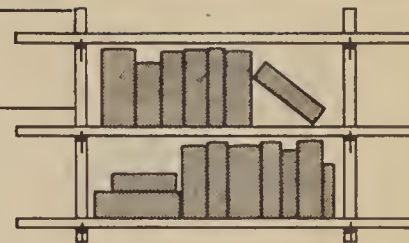
By Henry E. Riggs

In high-tech companies, technology is the key to business strategy. Engineers seem to predominate, prod-

uct life cycles are short, the risk is high and change rapid. Directing a company in such an environment demands a special sort of manager, or at least an average manager who understands the special environment in which he operates.

Henry Riggs is currently vice-president for development at Stanford University and director of several Silicon Valley companies. From

experience and study, he creates a broad picture of the high-tech company, covering market choices, debt financing, capacity planning, product forecasting, quality circles, vertical integration, corporate culture and much more. For anyone working in high-tech as an engineer or production manager or marketer, this book allows him to place himself in the wider context of the company.



The emphasis is on the differences compared with other industries. High-tech plants tend to be smaller because the economies of scale occur sooner in a plant's growth and because smaller means better in terms of communications. Exploitation of the technology is just as likely to come as the brainstorm of a marketer as an engineer, and customers may be the single best source of ideas.

Riggs intends the book to be a pragmatic look at high-tech companies showing the relationships between engineering, production and marketing. The more each department knows of the others' functions and purpose within the organization, the better they all work together toward the corporate goals.

Hardcover, 340 pages, \$35, ISBN 0-534-02720-2. Lifetime Learning Publications, 10 Davis Drive, Belmont, Calif. 94002.

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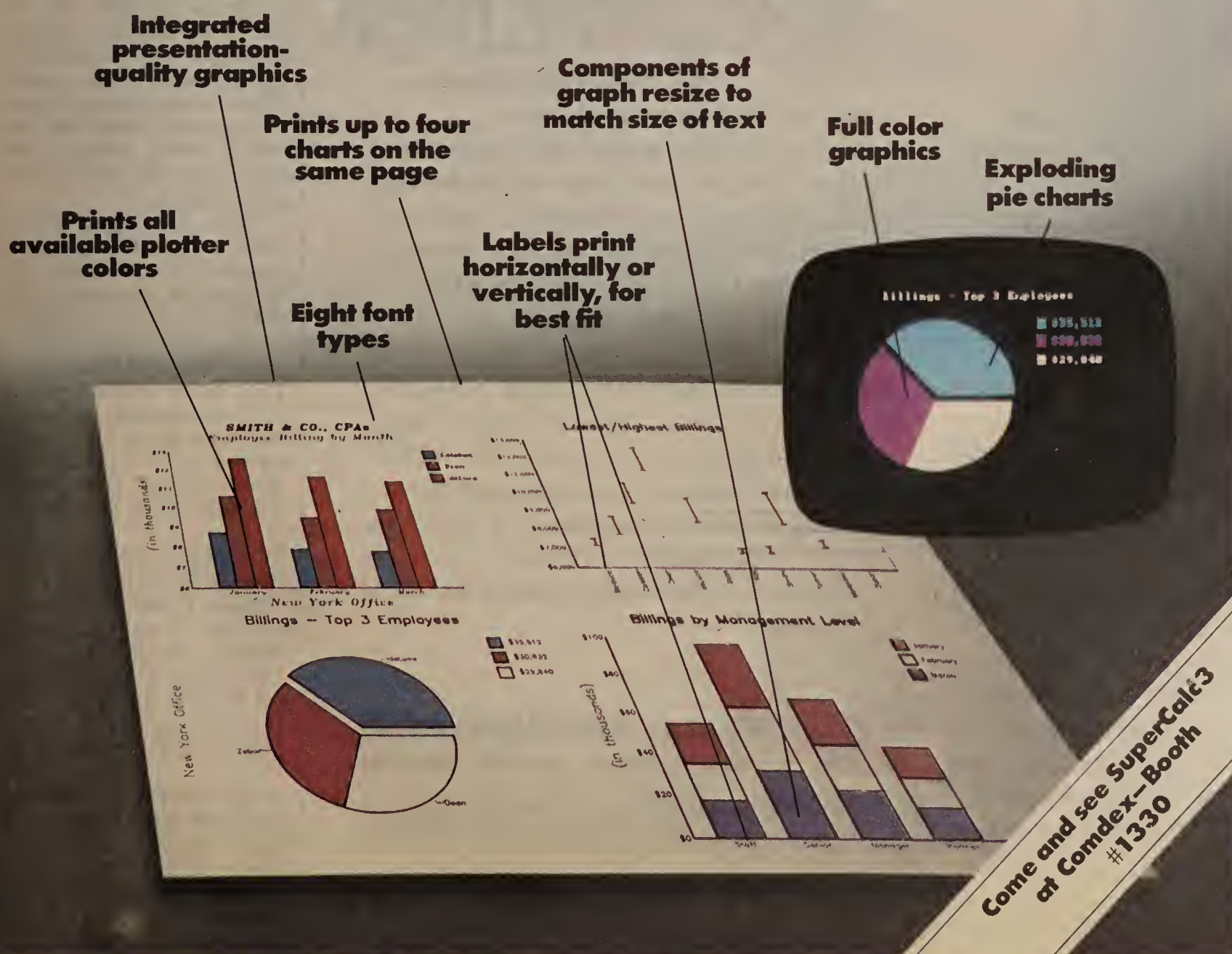
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THE PRACTICE OF STRUCTURED ANALYSIS: EXPLODING MYTHS

By Robert Keller

The latest from the Yourdon House of Structured Analysis is purposely short on theory and long on practical advice. This publication posits a world of systems development too unpredictable to be fully governed by any theory. Keller does not offer anecdotes of real DP life, expecting the reader to ferret out the lessons and put them to use in their own companies. He prefers to describe the ideal, structured manner of operating, with accompanying comments of what to do when — as so often happens — the real diverges from the ideal. Sometimes problems even demand non-structured solutions, and the author presents those instances as well.

(Continued on Page 38)

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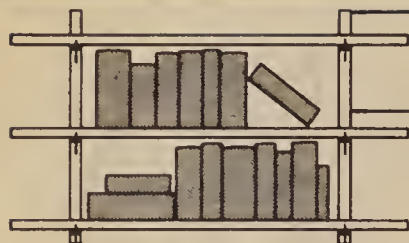
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(Continued from Page 37)

The book opens with an overly dramatic portrayal of the analyst as hero and systems development as "a hero journey." This chapter does no more than justify the subtitle — "Exploding Myths" — and the cover art — a dragon, of course. Skip to

Chapter 2.

Now we get into definitions as found in the structured analysis lexicon. "Physical," in reference to data, means implementation dependent, and "logical" means implementation independent. Definitions lead to notation and storage of data, to data flow diagrams (DFD) and finally to DFD process descriptions. That said, the author moves to the second

half of the book to fulfill in 50 pages the promise of examining structured analysis as a matter to practice rather than preach. More time could have been spent here, more examples offered, more advice from the structured analysis perspective rather than so much explanation of the methodology itself. In this form, the book serves novices far better than those already familiar with the

structured way.

Cloth, 136 pages, \$18.50, ISBN 0-917072-31-6. Yourdon Press, 1133 Ave. of the Americas, New York, N.Y. 10036.

HIGH-TECH CONSULTING: A GUIDE TO MAKING MONEY AS A COMPUTER CONSULTANT

By John Zarrella

A consultant answers to no man; decisions are his. He

is untethered from a rigid salary structure, free to earn according to his talents and efforts. He escapes office politics and the often grating behavior of upper management.

Such a rosy picture lures many each year to take off the corporate blue suit and try on a different life-style. Consulting *can* bring freedom, wealth and inner peace to those good enough to declare themselves experts and convince others of it. But consulting also brings binding contracts, with the client as boss. Consulting requires earning about 170% of your employed salary to make up for losing paid insurance, vacation, pension and office overhead. Consulting typically means one man working by day, marketing himself by night, with no co-worker to substitute in case of sickness or fatigue.

For those of risky nature ready to take a calculated jump into self-employment, the author covers all the details, some of which would no doubt go forgotten until they grew into business-threatening problems. Filing for a business license, incorporating or not incorporating, choosing office furnishings and billing forms are discussed here among the larger issues of finding clients, restricting liability and getting paid (by negotiating your way onto the client's "quick pay" list).

Advice specific to the high-tech industry appears sparingly — for instance, in the section on what not to forget in estimating a hardware project. Otherwise, the author could change titles and market the book to any other industry.

Cloth, 167 pages, \$18.95, ISBN 0-935230-08-4. Microcomputer Applications, 827 Missouri St., Fairfield, Calif. 94533.

Books of Note

THE NEW ALCHEMISTS, by Dirk Hanson: softcover, 364 pages, \$4.50, ISBN 0-380-65854-2. Avon Books, The Hearst Corp., 1790 Broadway, New York, N.Y. 10019.

REFERENCE ENCYCLOPEDIA FOR THE IBM PERSONAL COMPUTER, edited by Gary & Karen Phillips: loose-leaf binder, 1,000 pages in two volumes, \$69.95. Ashton-Tate, 10150 W. Jefferson Blvd., Culver City, Calif. 90230.

MANAGEMENT INFORMATION SYSTEMS, by Jerome Kanter: hardcover, third edition, 448 pages, \$27.95, ISBN 0-13-549543-1. Prentice-Hall, Inc., Englewood Cliffs, N.J. 07632.

NETWORKING VS. NOTWORKING:

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Call for Papers

THE NATIONAL EDUCATIONAL COMPUTING CONFERENCE (NECC), Dayton, Ohio, June 13-15, 1984.

Authors are invited to submit papers describing actual experiences with computer use in the classroom or the consequences of such use on education in general. Papers should report concrete results or be survey or tutorial in nature and include a synthesis and thorough evaluation. Generally, papers that describe projects presented at previous conferences will not be considered unless substantial new information can be reported. Authors should provide a brief synopsis of the earlier paper, clearly indicating the new information. It is expected that most papers will report on specific materials, problems, programs and measures of success or accomplishment. Papers reporting negative results are also encouraged, especially when the results could have a profound effect on the way educational computing is viewed.

Each paper will be evaluated by at least two referees knowledgeable in the area of the paper and familiar with the type of institution from

which it is submitted. Referees recommended by particular cooperating organizations will be directly involved in assessing papers which represent the interest of that group. Papers will be rated on originality, clarity, relevance to the goals of Necc '84, information in the paper and usefulness to the attendees. (Usefulness here refers to transportability of programs and materials or to the potential use of the information and ideas in papers where programs and/or materials are not presented.) Because the proceedings will be distributed at the conference, papers will not be conditionally accepted subject to rewriting.

Authors are to submit an original manuscript and four copies. Papers should be typed, double-spaced and not exceeding 15 pages. Pictorial material should be no larger than 8- by 10-in. glossy black-and-white photographs or other illustrations suitable for photoreduction. The title page of each manuscript must contain the author's name, complete mailing address and telephone number. Each page should have the principal author's name in the upper left-hand

corner. If there are multiple authors, the title page should indicate which author will handle correspondence and deliver the talk.

The release of copyright to the conference is a necessary condition for acceptance of a paper. Accepted papers must be retyped by the author in a form suitable for reproduction. Authors will be sent appropriate copyright release forms and forms for retyping the accepted papers.

Paper deadline is Dec. 15, 1983. Papers should be sent to: A.J. Turner, Department of Computer Science, College of Nursing Building, Clemson University, Clemson, S.C. 29031.

THE SOCIETY FOR INFORMATION MANAGEMENT 1984 SOCIETY AWARDS COMPETITION.

The Society for Information Management has issued a Call for Papers for its 1984 Awards Competition. First place award will be \$5,000, and the paper will be published in the "MIS Quarterly." Awards up to \$3,000 are made to runners-up, and all finalists in the competition

will be reviewed for publication in the "MIS Quarterly."

To be eligible for the competition, a paper must describe a management information system (MIS), an approach to developing information systems, a technique for improving MIS activity or the management of the MIS activity. The work described must be in-place and implemented and must have been evaluated and judged to have had a significant impact on the organization involved, as in contributing to improved profits, services or communications. Telecommunications and word processing are also acceptable topics.

Since the focus of the society is on top management, the work described must address top management issues — the impact of systems support on top management decision making, the timely and/or effective presentation of information to top management. Papers must clearly define a conceptual and managerial context in which to view the work. Impact of the work must be validated by the senior user management of the organization where the work was implemented. The work described should relate to the management of the information systems resource within a complex organization, rather than to the technology of information handling.

Applicants for the competition must submit an abstract of their work by Dec. 15, 1983. The abstract must be no longer than 1,000 words and must include a brief statement of the work, its impact, the extent of its implementation and statements of senior managers validating the impact.

Papers should be submitted to E. Nancy Markle, vice-president for Information Services, Federal National Mortgage Association, 3900 Wisconsin Ave. N.W., Washington, D.C. 20016.

THE TRENDS AND APPLICATIONS CONFERENCE, Silver Spring, Md., May 23-24.

The conference will be cosponsored by the National Bureau of Standards and the IEEE Computer Society. The subject selected for 1984 is "Making Data Base Work."

Papers are being solicited in the following areas of data base: user interface, new technology, overcoming barriers, management, controls and applications.

Notification to authors of acceptance will be made by Feb. 1, 1984, and camera-ready manuscripts for the proceedings will be due by March 15, 1984. Further information and a copy of the call for papers are available through Trends and Applications '84, P.O. Box 639, Silver Springs, Md. 20901.

Authors are requested to submit three copies of completed papers by Jan. 15, 1984 to: Dr. David Jefferson, Trends and Applications '84, P.O. Box 639, Silver Spring, Md. 20901.

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sity floppy drives. Plus a separate memory to maintain ongoing 3178/3278 functions while in the PC mode.

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Survey Needs Participants

SANTA MONICA, Calif. — CRWTH Computer Coursewares is seeking 2,000 participants for a survey on the current status of the information center.

A questionnaire has been developed to identify the stages of implementation, user population, staffing requirements and responsibilities of the information center, CRWTH said. Another goal is to determine the software and hardware supported by the information center and to ascertain the role of the microcomputer vs. the mainframe, so that appropriate training materials can be developed for the end users of the information center.

The results of the survey will be published in the upcoming CRWTH newsletter, a publication for information center managers and computer-based training specialists. Questionnaire respondents will receive copies of the survey findings.

Interested parties may obtain copies of the questionnaire by sending their business cards to Bibi Garcia at CRWTH, Suite 200, 613 Wilshire Blvd., Santa Monica, Calif. 90401.

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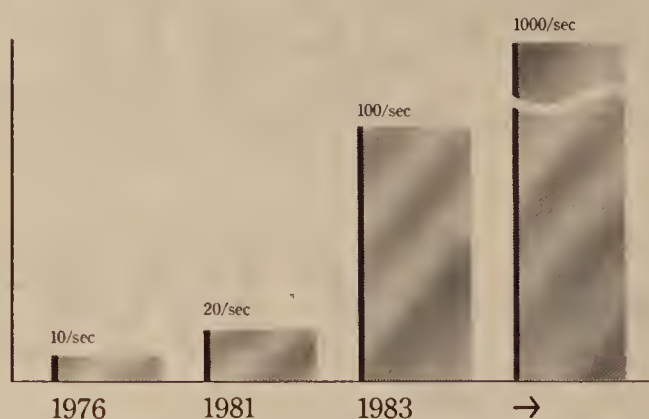
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TXP: 32-bit transaction processing.

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To help memory keep pace with that kind of processing, TXP pulls 64 bits on each memory access.



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The TXP system also features parallel data paths. Manipulating 32 bits of information in a single cycle. Or two 16-bit operations in the same cycle.

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Cache memory pays off in faster response times.

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A system you'll expand, not disband.

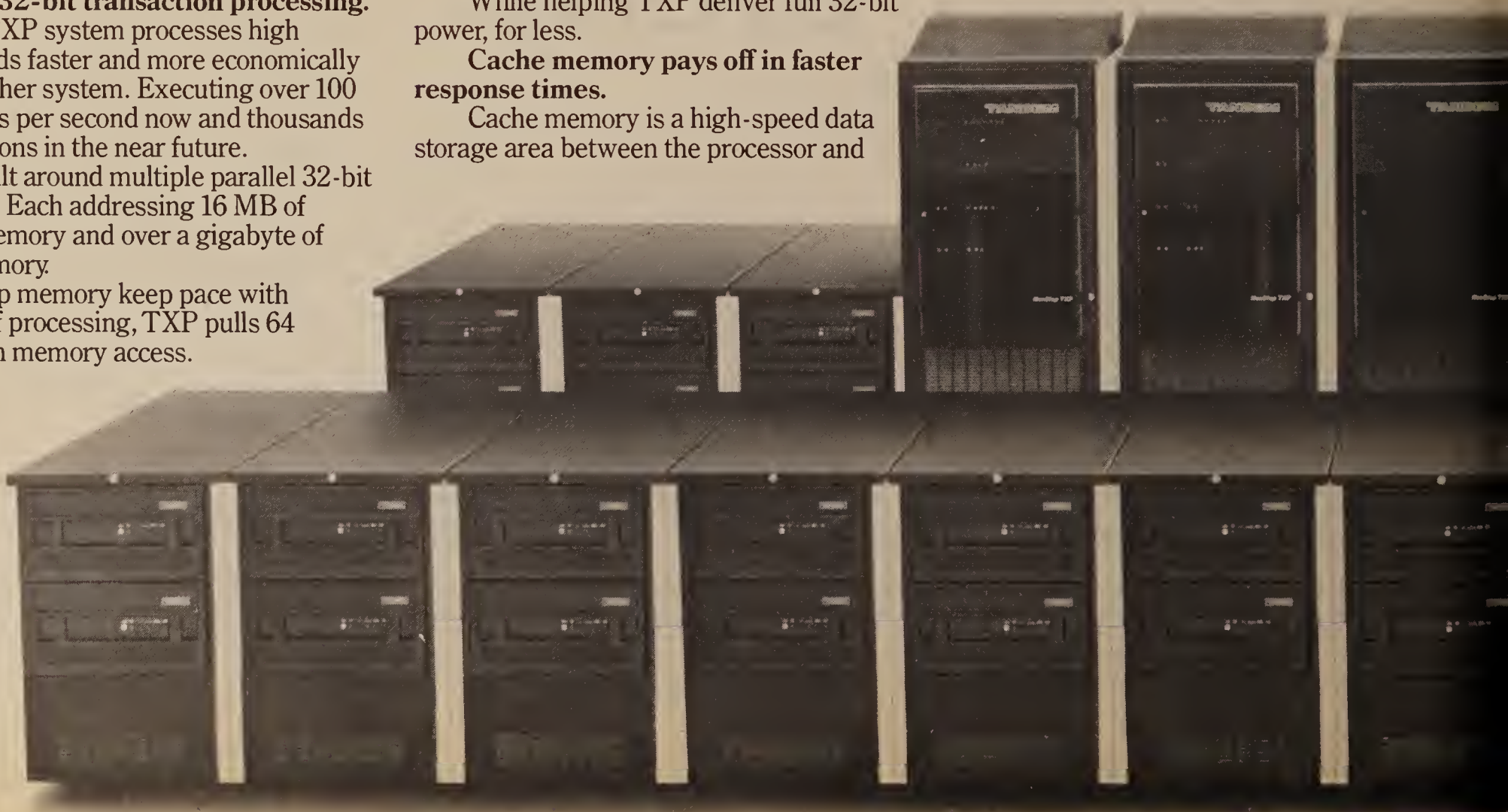
Most computer systems have very limited expandability. So if a company outgrows its computer's capacity, it usually means starting again from scratch.

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Then reprogramming.

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Plus all the chaotic disruption and



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computer in business today.

massive loss of revenue that's unavoidable during the switch-over.

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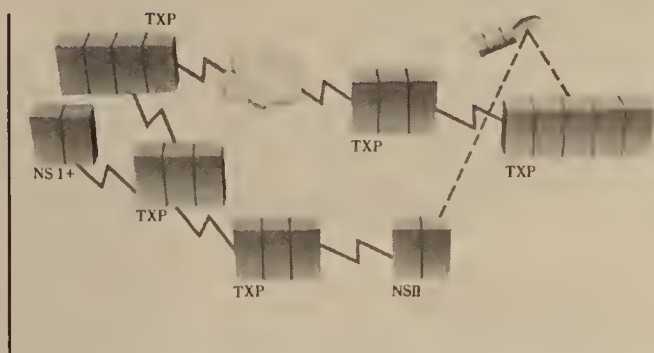
And the additional processors can be installed while TXP is running at full speed. No downtime. No reprogramming.

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And that gives TXP the most powerful on-line computer capacity in business.



The most powerful computer network in business today.
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NonStop II™ system. The second most powerful on-line computer in business today. The cost effective solution for

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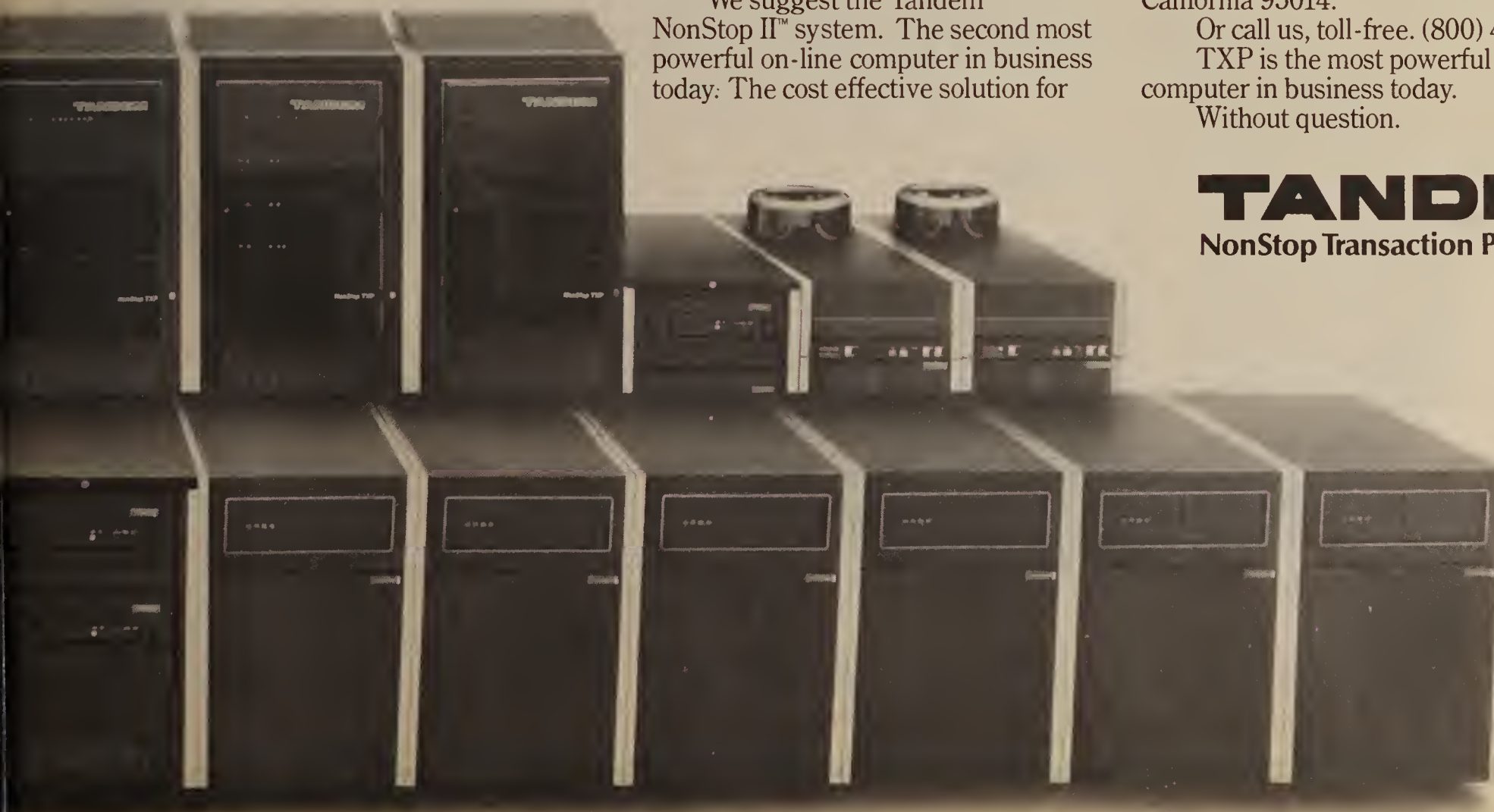
Or write Tandem Computers Incorporated, 19333 Vallco Parkway, Cupertino, California 95014.

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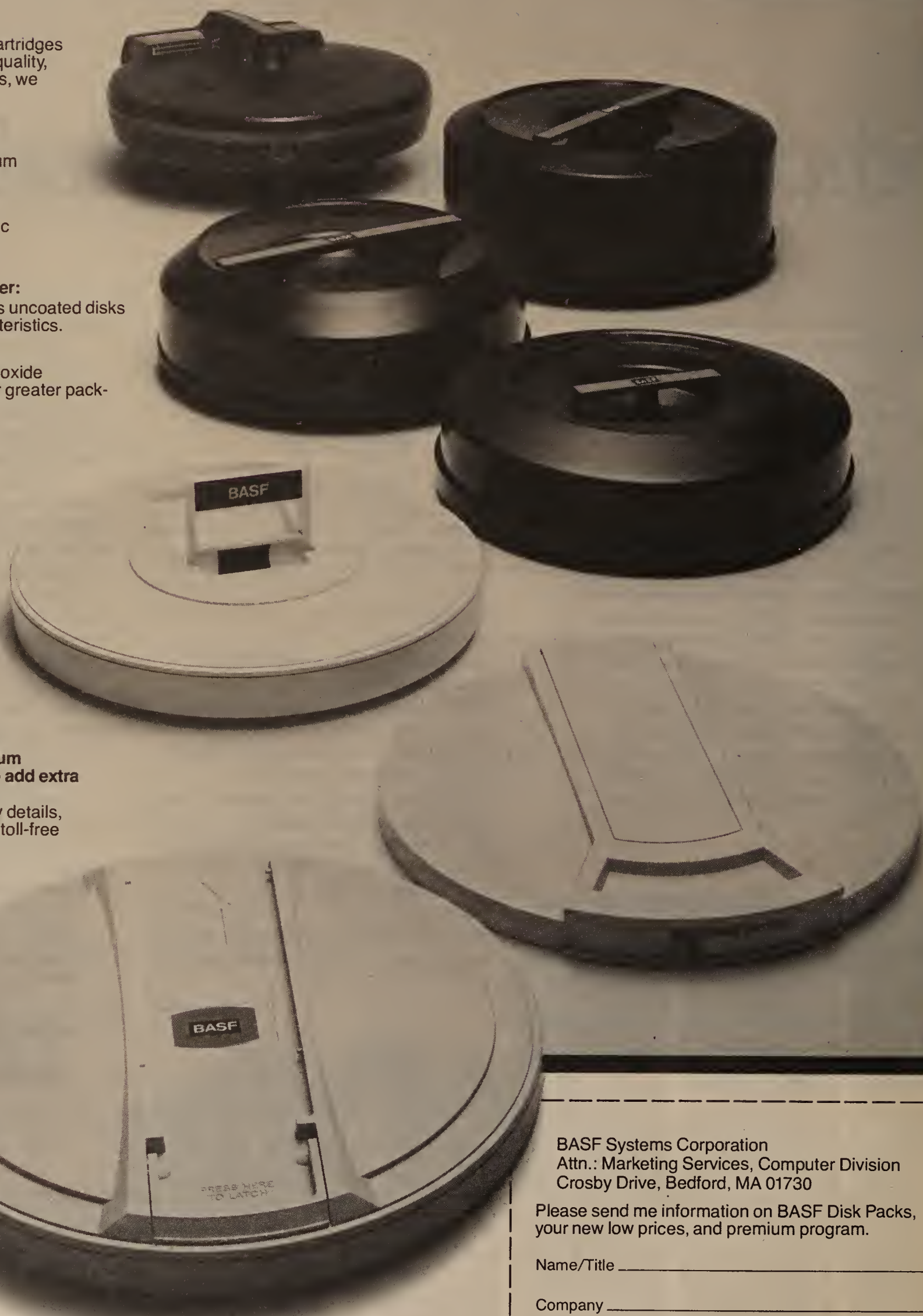


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Calendar

Week of Nov. 27

Dec. 1-2, New York — **How to Analyze and Evaluate the Cost and Service Impacts of the New Tariffs, Access Charges and Divestiture on Your Telecommunications Networks.** Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

Dec. 1-2, Los Angeles — **Computer Networks: Protocols, Standards and Compatibility.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 1-2, Palo Alto, Calif. — **Fifth-Generation Languages.** Contact: Data Processing Management Association Education Foundation, Department FGL, Suite 2000, P.O. Box 3608, 3420 Kashiwa St., Torrance, Calif. 90510. Also being held Dec. 5-6 in Los Angeles.

Dec. 1-2, Washington, D.C. — **Cost-Effective Software Design.** Contact: Data Processing Management Association Education Foundation, Department CESD, Suite 2000, P.O. Box 3608, 3420 Kashiwa St., Torrance, Calif. 90510.

Dec. 1-2, Atlanta — **Micros in the Corporate Environment.** Contact: Techtran, 72 Cummings Point Road, P.O. Box 10212, Stamford, Conn. 06904.

Dec. 1-2, New York — **Telecommunications Strategic Planning Methodologies.** Contact: Marilyn Chasteen, The DMW Group, Inc., 2020 Hogback Road, Ann Arbor, Mich. 48104.

Dec. 1-2, Minneapolis — **Software Engineering.** Contact: Battelle, 4000 N.E. 41st St., P.O. Box C-5395, Seattle, Wash. 98105. Also being held Dec. 8-9 in Detroit.

Dec. 4-6, Andover, Mass. — **Electronic Document Distribution.** Contact: Institute for Graphic Communication, 375 Commonwealth Ave., Boston, Mass. 02115.

Dec. 4-7, Atlanta — **The Fifth International Conference on Automation in Warehousing.** Contact: Institute of Industrial Engineers, IIE Conference Department, 25 Technology Park/Atlanta, Norcross, Ga. 30092.

Week of Dec. 4

Dec. 5, New York — **Introduction to the IBM Personal Computer.** Contact: Center for Advanced Data Processing, Inc., Suite 402, 450 7th Ave., New York, N.Y. 10123.

Dec. 5, New York — **Structured Systems Development.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Dec. 5, New York — **CICS/VS Concepts and Facilities.** Contact: Teltech, 39

Broadway, New York, N.Y. 10006.

Dec. 5-6, Los Angeles — **Local-Area Networks: Selection and Guidelines.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 5-6, Dallas — **Voice Mail and Messaging Systems: How to Select, Implement and Manage.** Contact: Business Communications Review, 950 York Road,

Hinsdale, Ill. 60521.

Dec. 5-6, San Francisco — **Quality Assessment of Analysis and Design.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Dec. 5-6, Dallas — **Office Automation.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

Dec. 5-6, New York —

Computers and Management. Contact: Grumman Data Systems Institute, Center for Professional Development, 280 Crossways Park Drive, Woodbury, N.Y. 11797.

Dec. 5-6, Washington, D.C. — **Quality Assurance and Verification and Validation.** Contact: Data Processing Management Association Education Foundation, Department SQA, Suite 2000,

P.O. Box 3608, 3420 Kashiwa St., Torrance, Calif. 90510. Also being held Dec. 12-13 in Boston.

Dec. 5-6, San Francisco — **Systematic Software Testing.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Dec. 5-6, Detroit — **Implementing Personal Computers in the Corporate Environment.** Contact: The
(Continued on Page 47)

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Calendar

(Continued from Page 45)

American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940. Also being held Dec. 6-8 in Minneapolis, Dec. 12-13 in Philadelphia, Dec. 15-16 in New York and Dec. 19-20 in Chicago.

Dec. 5-6, San Francisco — **Team Management Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Dec. 5-6, Natick, Mass. — **Programmable Controllers: Basis of the Control Revolution.** Contact: Kathy Shaw, Office of Continuing Education, Higgins House, Worcester Polytechnic Institute, Worcester, Mass. 01609.

Dec. 5-6, Chicago — **Rational Data Bases: Fact or Fancy?** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 5-6, Chicago — **Managing Projects in the Structured Environment.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Dec. 5-6, Dallas — **Enhancing SAS Technical Support Skills.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

Dec. 5-6, Nashua, N.H. — **Corporate Problem Solving with Microcomputers.** Contact: New Hampshire College, Resource Center, 2500 N. River Road, Manchester, N.H. 03104.

Dec. 5-6, Chicago — **Micro/Mini Financial Applications Conference.** Contact: Financial Managers Society, Inc., 111 E. Wacker Drive, Chicago, Ill. 60601.

Dec. 5-7, Dallas — **Structured Analysis for Users.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held Dec. 5-7 in San Francisco.

Dec. 5-7, Chicago — **Data Administration: Successful Techniques.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 5-7, San Juan, Puerto Rico — **Data Communications Systems.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held Dec. 7-9 in Woodbury, N.Y.; Dec. 14-16 in Los Angeles; and Dec. 19-21 in Dearborn, Mich.

Dec. 5-7, New York — **Internal Controls and Data Security Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Dec. 5-7, New York — **Data Communications: An Introduction to Concepts and Systems.** Contact: Data-

pro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075. Also being held Dec. 5-7 in Atlanta.

Dec. 5-7, Atlanta — **Minis/Micros With IBM Mainframes.** Contact: Techtran, 72 Cummings Point Road, P.O. Box 10212, Stamford, Conn. 06904.

Dec. 5-7, Chicago — **Introduction to Computer Concepts.** Contact: Yourdon, Inc., 1133 Ave. of the Ameri-

cas, New York, N.Y. 10036.

Dec. 5-7, Denver — **DP Project Management: A Practical Approach.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 5-7, Washington, D.C. — **Personal Computers: Strategies for Managing.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 5-7, San Francisco —

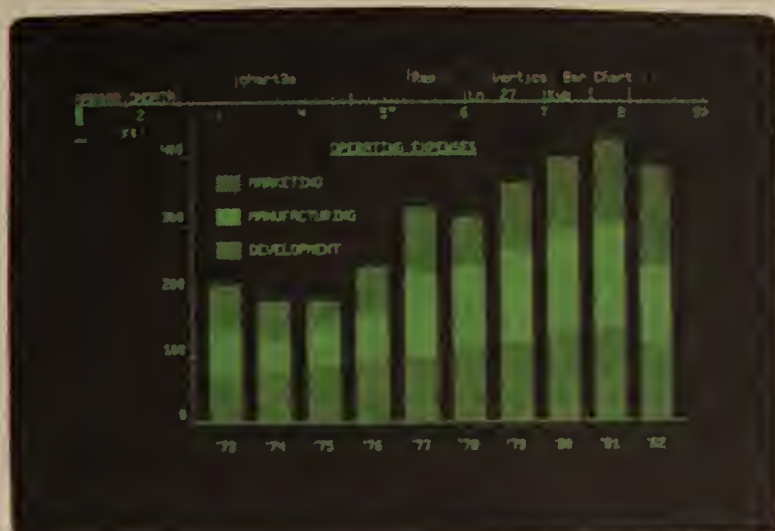
The First International Conference on The Future of Optical Memories, Videodisk and Compact Disks to the Year 2000. Contact: Technology Opportunity Conference, P.O. Box 14817, San Francisco, Calif. 94114.

Dec. 5-7, New York — **Structured Testing.** Contact: McCabe and Associates, Inc., Suite 111, Twin Knolls Professional Park, 5501 Twin Knolls Road, Columbia, Md.

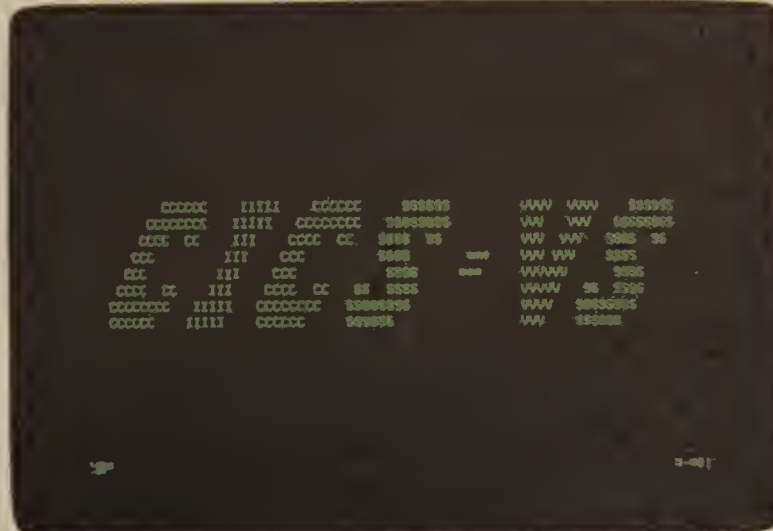
21045.

Dec. 5-7, Phoenix — **Network Communications Protocols.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held Dec. 12-14 in Washington, D.C.; Dec. 14-16 in Philadelphia; and Dec. 19-21 in Irvine, Calif.

Dec. 5-7, San Francisco — (Continued on Page 48)



Hour	Rate	Spice Sales	Gross Wages	Tax
30.00	7.50	225.00	225.00	5.00
40.00	20.00	800.00	800.00	20.00
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Calendar

(Continued from Page 47)
Basic Systems Analysis. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Dec. 5-7, Dallas — **Microcomputer Systems: A Guide to Selection and Application.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 5-7, Dallas — **CICS/VS Internals for Systems Programmers.** Contact: Goal Systems International, Inc., 5455 N. High St., Columbus, Ohio 43214.

Dec. 5-7, Orlando, Fla. — **Data Dictionaries: Concepts, Contents and Uses.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

Dec. 5-7, Anaheim, Calif. — **Data Communications Concepts and Facilities.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Dec. 5-7, Washington, D.C. — **Data Communications for Microcomputers: Acquisition, Applications and Implementation.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 5-7, Los Angeles — **CICS/VS On-Line Design.** Contact: Southern Training Corp., Suite 1030, SCN Center, P.O. Box 11692, Columbia, S.C. 29201.

Dec. 5-7, Chicago — **Data Base Management Systems for Micros and Minis.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 5-7, Chicago — **Project Leadership Laboratory.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held Dec. 5-7 in San Francisco.

Dec. 5-7, Washington, D.C. — **Project Management for Telecommunication Systems.** Contact: Architecture Technology Corp., P.O. Box 24344, Minneapolis, Minn. 55424.

Dec. 5-7, New York — **Office Automation: Strategic Planning, Design and Implementation.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 5-7, Boulder, Colo. — **International Tele/Conferencing Symposium.** Contact: Cross Information Co., Suite B, 934 Pearl Mall, Boulder, Colo. 80302.

Dec. 5-8, Washington, D.C. — **ADP and Telecommunications Acquisition Management.** Contact: George Washington University School of Government and Business Administration, ADP and Telecommunication Acquisition Management, Department K,

1805 Powder Mill Road, Silver Spring, Md. 20903.

Dec. 5-8, Boston — **National Data Base and Fourth-Generation Language Symposium.** Contact: Software Institute of America, 339 Salem St., Wakefield, Mass. 01880.

Dec. 5-8, San Diego — **Structured Analysis and Systems Architecture Seminar.** Contact: Janis Halsted, Oberland Associates, 4036

N.E. Sandy Blvd., Portland, Ore. 97212.

Dec. 5-8, Atlanta — **CICS On-Line Application Design.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Dec. 5-8, Fort Lee, N.J. — **IMS/DB (DL/1) Application.** Contact: Dianne Halper, On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

Dec. 5-9, New York — **Hands-On C Language Programming Workshop.** Contact: Structured Methods, Inc., 7 W. 18th St., New York, N.Y. 10011.

Dec. 5-9, New Orleans — **Establishing Computer Configuration Capacity.** Contact: Institute for Software Engineering, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

Dec. 5-9, Atlanta — **Ad-**

vanced Structured Analysis. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held Dec. 5-9 in San Francisco.

Dec. 5-9, Atlanta — **CICS/VS Command-Level Programming.** Contact: Data Base Management, Inc., 1075 Tolland Tnpk., Manchester, Conn. 06040.

Dec. 5-9, New York — **Project Management. Con-**

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tact: Brandon Systems Institute, 4720 Montgomery Lane, Bethesda, Md. 20814.

Dec. 5-9, Anaheim, Calif. — **Structured Analysis and Design Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held Dec. 5-9 in Chicago and San Francisco.

Dec. 5-9, Atlanta — **IMS Systems Management.** Contact: Institute for Software

Engineering, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

Dec. 5-9, San Francisco — **CICS/VS Internals.** Contact: Dianne Halper, On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

Dec. 5-9, Boston — **Structured Analysis and System Specification Workshop.** Contact: Yourdon, Inc., 1133

Ave. of the Americas, New York, N.Y. 10036. Also being held Dec. 5-9 in Houston and in Portland, Ore.

Dec. 5-9, Toronto — **Basic Systems Analysis.** Contact: Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

Dec. 5-9, Atlanta — **Structured Design Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New

York, N.Y. 10036. Also being held Dec. 5-9 in Phoenix and in Anaheim, Calif.

Dec. 5-9, Dallas — **IMS/VS Data Base Design.** Contact: Data Base Management, Inc., 1075 Tolland Tnpk., Manchester, Conn. 06040.

Dec. 5-9, Chicago — **Structured Design for Real-Time Systems.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held Dec. 5-9 in

Dallas, Phoenix and Washington, D.C.

Dec. 6-7, Washington, D.C. — **Personal Computer Local Networks.** Contact: Architecture Technology Corp., P.O. Box 24344, Minneapolis, Minn. 55424.

Dec. 6-7, New York — **Personal Computers: A Hands-On Experience.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

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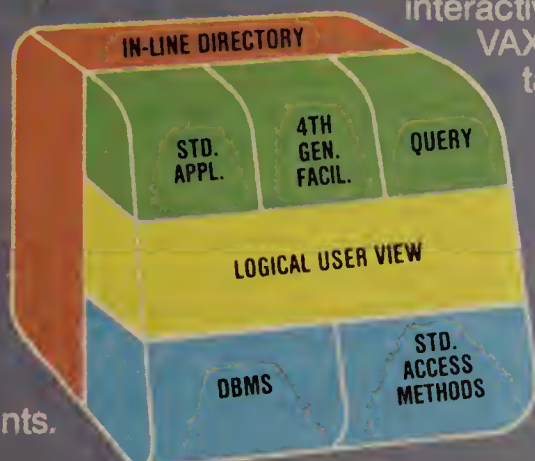
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EDITORIAL

Taking It Out on the Users

The Internal Revenue Service has dealt computer systems users an injustice by denying tax-exempt status to users groups devoted to a single vendor's product line.

The IRS ruled that such organizations can no longer qualify as tax-exempt business leagues [CW, Nov. 14] because they might give large computer vendors an unfair advantage over smaller firms. Now, to qualify for the tax-exempt status, users groups must allow manufacturers of competing systems to attend and participate in regular meetings.

To some degree, the IRS decision has merit. Big vendors such as IBM, which has three users groups, reap the benefits of well-attended meetings peppered with technical experts and consultants. The experts often make complaints and suggestions, which can be parlayed into highly successful products. Users groups devoted to smaller vendors' products lack the sheer numbers that large users groups like IBM's Guide, Share and Common draw. They often fail to draw the same level of technical experts, which puts the smaller vendors at a competitive disadvantage.

But why take it out on the users? The original idea behind users groups was to provide an open forum for users to discuss their problems, compare notes and ask questions. Users groups were never intended to provide brainstorming sessions for the vendors' benefit.

The vendors are not blameless either. Prime Computer, Inc., for example, refused to attend the February meeting of the Eastern Region Prime User's Group meeting because other vendors will be allowed to show their wares.

Without tax-exempt status, users groups will have to either rely more heavily on vendor funding or raise their membership fees and conference charges. Either option poses problems. If the users groups become more closely tied to the vendors, they can be bullied. If they retain their independence and raise their fees, some users will have to drop out or attend fewer meetings because the cost has become too high.

DATA PAST

Five Years Ago Nov. 27, 1978

DAYTON, Ohio — NCR Corp. announced its largest systems ever with the introduction of two mainframes featuring emitter-coupled logic, 64K-bit memory chip technology and gate speeds of 750 picosec. The NCR production was apparently aimed at competing with IBM's 3032 and 3033 processors.

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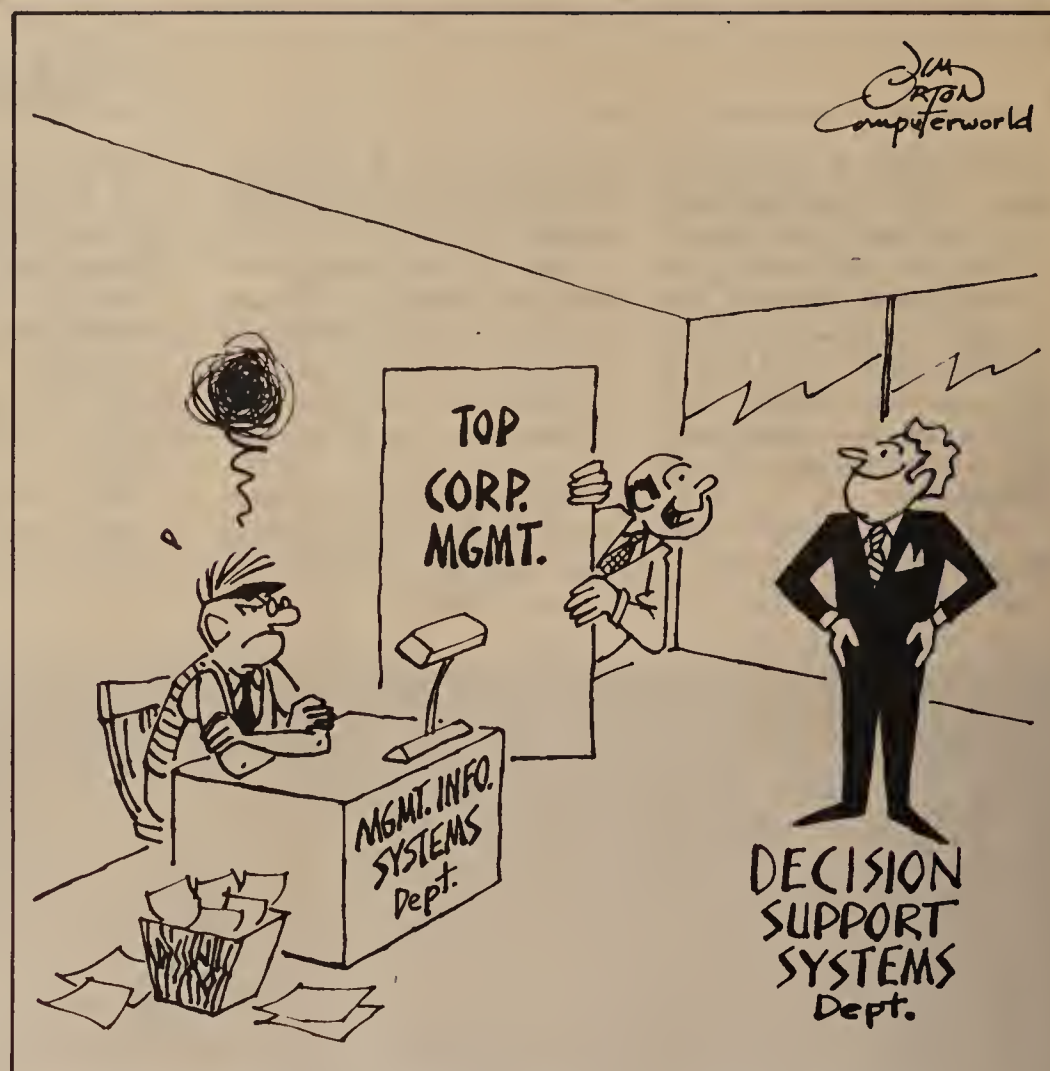
RICHMOND, Va. — The State Board of Elections here completed its official statewide canvass of the U.S. Senate election votes to settle a contest that had been troubled by computer foulups and human inaccuracies. Unofficially, Republican John W. Warner defeated Democrat Andrew P. Miller earlier this month in what was described as the closest general election in recent Virginia history. However, the accuracy of the 1.2 million vote count and the News Election Services computer were questioned because of numerous delays and discrepancies.

Ten Years Ago Nov. 28, 1973

OTTAWA — The Canadian government issued a patent on a software system the inventor described as a "revolutionary" approach to management reporting, analysis, financial and accounting operations that are so "fundamental" to business, the patent "will affect the entire accounting and computer industry." The patent was issued to David M. Homa, president of Xoma Ltd., a Montreal-based consulting firm, who warned that he intended to have his invention recognized and royalties paid to his company.

— — —

LOS ANGELES — IBM countersued California Computer Products, Inc., charging that the firm had monopolized the market for digital plotters and, therefore, kept IBM from entering that market. The move came from the IBM legal team, which dealt with all of the members of the plug-compatible peripherals market presently suing IBM.



'Welcome aboard, my boy — sorry to keep you waiting!'

LETTERS

'Qualified' DP Applicants

In recent issues of DP trade publications and *The Wall Street Journal*, articles have again appeared complaining of the difficulty in finding "qualified" DP applicants.

All of these articles discussed those in the top 10% to 20% (preferably the 10%) who are happy at their present jobs, highly productive and are the most desired applicants because they are considered to be the "best qualified."

It is these applicants DP managers seek to induce to leave their current jobs in DP for new ones. The implied assumption is that those not in the upper 10% to 20% range that are currently employed are, for various reasons, unqualified or unattractive as applicants.

This assumption that only those who are currently employed are qualified, because those who are not employed are obviously deficient, is one of the popular hiring myths that is widespread throughout the U.S. and creates a roadblock against the unemployed.

This assumption is bias-laden, opinionated, myopic and unjust. It can be proven simply by thinking for a few minutes of the hundreds of different reasons people are fired or laid off, reasons that have nothing to do with performance, abilities or skills.

Any number of books dealing with industrial psychology, personnel or job tenure can detail lists of reasons for firings.

These articles reveal some very interesting facts when viewed beyond the surface-level opinions. According to the cries of the many DP managers who supposedly represent widespread managerial thinking in DP as reported in these articles, only 10% to 20% of employees are happy and productive.

It has been asserted that people

who love their jobs will always be happier, more productive and more successful compared with those who are not. Only those who are strongly motivated by their job tasks will fit into the employee class indicated above.

If one applies these valid and firm observations, which result from sound motivation principles, to the 10% to 20% figures sought by DP managers, one must conclude that only 10% to 20% of DP employees are strongly motivated.

This means that only 80% to 90% of DP employees are not strongly motivated.

What a sorry condition in data processing that the very managers who condemn the unemployed DP workers as unqualified and therefore not worthy of serious consideration for new DP jobs have themselves been able to build a motivational work atmosphere of only 10% to 20% of their DP employees.

In other words, out of a 100-person DP department, only 10 to 20 employees are strongly motivated by their DP job tasks and environment.

John Callahan
Arlington, Texas

A Thief Just the Same

Max Schindler's letter to the editor [CW, Oct. 24] asserts that if Benet N. Babcock leaves the doors to his house open when he goes on vacation the silver thieves can't be convicted.

This is nonsense. It may be silly not to have security, but trespassing or theft is trespassing or theft even if the door is open.

I agree it would be silly for the bank to leave the vault unlocked at the end of the day, but if Schindler goes in and takes the money, he's a thief just the same.

Ben Cohen
Chicago, Ill.

HUMAN CONNECTION/Jack Stone†

There's More Than One Way to Hunt a Duck

My friend, Capt. J. Donald Griffin, one of the world's all-time great professional hobbyists, called me recently to talk about the need for bringing small microprocessors into the hunting of ducks, one of his favorite pastimes.

Because of the unusual significance of this topic, the fact that little attention has been given to it in the trade press and the recent trend toward environmentalism, I felt that the topic was timely for this column. Here's what Griff had to say:

"The sport of duck hunting, unbeknownst to those who don't participate, is governed by laws that were largely created centuries ago and, in a number of respects, force many hunters to run somewhat afoul of the law. Here's the way it works:

"Most states assign values to ducks based on a 'point' system and allocate a hunter so many points a day, typically 100. This is perfectly acceptable when you stalk a flock of teal or goldeneyes, usually rated at 10 points a head. But wood ducks and redheads go for 70 or more, so one good shot would spoil the rest of the day's outing.

"Some outdoorsmen have thought

'One notion I have is to connect a little passive radar scanner to an input channel of the computer and do a little in-flight tracking. Then, too, a computer-driven voice synthesizer and loudspeaker system would be useful to generate appropriate duck calls.'

about a computerized system in which every bird is marked with a class identifier code, and the hunter is supplied with a palm-size computer for fowl data processing. After spotting a bird's code through a telescopic sight, the hunter need only punch in the code along with a state ID symbol and the computer would respond with 'snow goose, Maryland, 60 points, maximum daily allowance 120 points.

Chip-Based 'Bird Tag'

"Others have even suggested that a chip-based 'bird-tag' be used, one with a little radio frequency transmitter, so that when the bird comes into range, a signal would be sent to the computer, displaying the class of bird, point count, aggregate points at

that time and a recommendation on whether or not to shoot.

"These people haven't gone far enough, apparently not appreciating that state-of-the-art techniques permit us to move much further ahead. One notion I have is to connect a little passive radar scanner to an input channel of the computer and do a little in-flight tracking. Then, too, a computer-driven voice synthesizer and loudspeaker system would be useful to generate appropriate duck calls.

"In addition, there is the need for a militarized version of the machine to maintain system reliability in the frigid, moisture-filled, mud-laden, Eastern Shore marshland that we typically encounter during hunting season. There aren't many customer

engineers who are willing to get out-fitted in hip boots to fix hardware bugs at four in the morning.

Automatic Unloading

"Still others have suggested that the hunting gun be under the control of the computer facility so that, for example, when the hunter had achieved his daily limit, the gun would automatically unload itself and replace itself in its case.

"So far, so good. But we desperately need a highly mobile robot that would replace a dog and tear across swamps at high speeds to retrieve our bags.

"I can hardly elaborate on the idea of the government prepackaging nuclear-powered ducks and giving each hunter a federal water fowl stamp and a personal display unit that he can use only during official hunting hours. The computer would identify the ducks from their radiation signals, figure the proper combination of targets to meet the daily limits and blank out the screen when the limit is reached. Now that's real computerization!"

Letters to Stone should be addressed to Box 33699, Washington, D.C. 20033.

GETTING AHEAD IN DP /Donald J. Berardo†

The Work-Obsessed DPer: A High Price to Pay for Success

Many professions, including DP, say that it is absolutely necessary to "get the job done" or to "meet our corporate demands." In fact, studies have shown that most of us continue to think about our work throughout the day and night whether we're actually working or not.

The total time we spend thinking about and doing our DP tasks can be as high as 15 hours or more per day — for six days each week — or up to 4,500 hours per year. Now try to calculate your hourly rate using your own figures or the think-time and work-time figures above.

These facts are only the beginning of a gruesome picture of how many of us strive to succeed. The actual toll on our health, our family life and our longevity because we don't leave our work at work can be psychologically and physically devastating. However, most DPer's would agree that the results justify the means — that success and money may buy all of the pleasure and happiness that we need. But this is wrong.

Most national studies on health in the work place indicate a strong connection between work stress and a host of illnesses. DPer's, in particular, suffer from a special kind of "workaholic" that can cause them to be victimized by the insatiable matrix/DP monster.

High divorce rates, widespread depression, high blood pressure, poor vision, chronic headaches, peptic ulcers, alcoholism and other drug-related addictions are only a few of the problems related to the DPer's dilemma.

lemma.

The DPer seems to express an inability to restructure his life so that it becomes more balanced and pleasurable. As a group, DPer's simply automate themselves into an early grave because their work stress is always with them. Like a continuous loop subset, it invades every cell of their existence. It causes DPer's to carry their work home too often and to confuse the healthy boundaries they need to separate work, family and play.

Ironic Failure

An inescapable result of each striving is to risk illness, divorce and, ironically, failure at home and at work. DPer's, accountants, lawyers and others don't have to live this way; some basic changes in their priorities and expectations can bring enormous personal rewards.

First, as much as you can, examine every detail of your present work and personal life. This is initially cumbersome and aggravating, but it gradually shows you where you are spending your time and with whom, what your priorities are and the way you work — smart and easy, or long and tough.

Now look at your data and your plan and ask yourself these questions: Can all of this be done in a normal workday of seven to eight hours? Do I have to do it all, or can I delegate? Are my priorities correct?

Gradually begin to simplify the process by using less detail: Use just

(Continued on Page 52)

THE DATA CENTER /John P. Murray†

Separating Maintenance From Development Function

Larry Long, in his article "Should DP Functions Be Separated?" [CW, Aug. 30, 1982], responded to a question from a reader who was concerned about a proposed organizational change that would separate the function of systems maintenance from development. The reader's concern was with the validity of such a structure.

Long favored the more traditional approach, which is to keep maintenance and development in the same section. I would like to suggest the alternative approach of separating the two functions. This is not necessarily a better approach, but it does have certain advantages. In many installations, the traditional approach has not proved to be terribly effective, so consideration of something else is worth a try.

There is a basic problem with the maintenance aspect of work or, as Long calls it, the "enhancement" effort. "Maintenance" is a word we should drop from our management information systems (MIS) vocabulary; its negative connotations do nothing to enrich the very necessary and important work that must be done to improve operational systems.

As long as the general perception is that all the glamour, excitement and reward are to be found in the design and development of new systems, the effort to encourage people to develop a strong interest in systems support work will be difficult. It is clear that there is an urgent and

growing need for improvement in the management of system enhancement functions.

How will the separation of the functions (development and systems support) improve the enhancement effort? Because of the different demands of each function, the emphasis of the work in one function causes distraction in the other.

Second-Class Status

Usually, unless the operational system is really "broken," the emphasis under the traditional approach is to place primary attention on the development of new systems. This means that enhancements become second-class items and, therefore, carry the connotation that the work is also second class.

As long as people feel that judgment of their performance and, consequently, their salary and promotion progress are tied to project results, as opposed to enhancement efforts, it will be difficult to build much enthusiasm for a consuming interest in systems support work.

Dividing the function into two separate but equal sections within the department, each with its own manager, can produce more effective results in both areas. The separation not only relieves some of the distraction of attempting to concentrate on two dissimilar entities, but also provides increased opportunity to focus on the specific area of concern. This makes it clear to each employee that

(Continued on Page 52)

Upgrading the Definition of Maintenance

(Continued from Page 51)

responsibility and performance measurement are linked to a specific area.

Under the proper management, the separate enhancement section will reduce the overall work load in the enhancement section and, at the same time, improve the image of the MIS department within the client area.

If the systems support group has the authority to negotiate with the development group for the quality of the system to be turned over to it for operational support, and if both managers work to see that appropriate standards are developed and adhered to, the general level of the initial systems will improve, and the scope of the enhancements will be less.

There is a benefit to the development group, even though it may have to deliver better systems than in the past.

'Workamania' Seen High Price For Success

(Continued from Page 51)

an outline. But most importantly, change your plan. A new plan must always include:

- Consistent playtime.
- Healthful sleep time.
- Pleasurable family time.
- Restful alone time.

Next, log all of the times and work-related topics that occur after a normal workday in order to decontaminate your other roles of any overtime, work-related thoughts or activities. Now come the most difficult steps: Give yourself permission to restructure your activities permanently in a more balanced, pleasurable way and concurrently solicit the cooperation of other key figures in your life so that you can follow through on your healthy changes.

Berardo is a management counselor and career therapist. He is a vice-president with the Meld Group in West Hartford, Conn., publishers of a monthly newsletter on management development.

LETTERS

Hypocrisy on TV

Reading the recent comments about hackers has caused me to be concerned about the security of my system, and I have taken the most simple of all security steps: I changed all the passwords.

What really has me concerned, though, is the glorification of the abuse of computer access on TV.

I wonder how long the networks could show children joyriding in cars, smoking a few joints and "borrowing" items from the neighbors before America's parents would be up in arms.

Amy E. Parker

Data Processing Manager

Arthritis Foundation
Atlanta, Ga.

'One of the drawbacks to the separation of the functions is that it produces increased tension between the managers of the respective areas. They are certain not to agree all the time on the conditions of acceptance, and discussions are bound to come up that will require some form of arbitration.'

Once it has been able to get the systems support group to accept the system as operational, it no longer has to worry about it. How many people in MIS have developed a system and then found that they "owned" that system whenever anything went wrong with it?

One of the drawbacks to the separation of the functions is that it produces increased tension between the managers of the respective areas.

They are certain not to agree all the time on the conditions of acceptance, and discussions are bound to come up that will require some form of arbitration.


These situations, in turn, create

some additional concerns for the MIS manager, but the net result, improved MIS performance, is worth the effort.

There may be an even more important issue here: the unwillingness of many MIS departments to change for the sake of developing something new.

However, such a change in the department's structure may help provide a fresh perspective for other concerns as well. In any case, it doesn't hurt to try.

Murray is director of MIS for Ray-O-Vac Corp., Madison, Wis. He is responsible for worldwide MIS activities. Murray has 21 years of DP experience, 10 of which have been devoted to the management of data centers.




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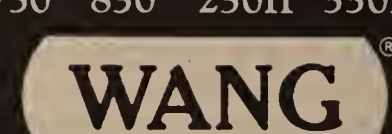
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Government DPers

Having subscribed to *Computerworld* for almost a year, I'm disappointed to find that there are not many articles on the data processing professional working for the government.

Do people in the DP industry feel that government DPers aren't paid enough? That they don't receive enough education? Why not examine government DPers?

At this time, the only category that recognizes my B.S. in computer science or requires a degree for qualification is for a mathematician. The highest I will be paid after 10 years of service is \$27,000 (this, of course, is based on the whims of the U.S. Congress).

What about those of us who do not work in DP? The engineering profession ignores us and the trade news-

paper industry ignores us. Where are we to turn?

I know that there are more of us out there.

Why not recognize us? How about more articles on our applications and equipment?

Elizabeth B. Lamberton
Bloomfield, Ind.

Formatting a Printout

In the article "This Country Needs a Good Portable Micro" [CW, Oct. 3], Jack Stone complains, quite rightly, that neither Radio Shack's operating manual nor its sales force can tell you readily how to format a printout on the TRS-80 Model 100, which is oth-

erwise a lovely little machine.

I discovered quite by accident in a footnote on Page 60 of a Radio Shack manual that, in addition to the limited means explained under the "printing" headings in the manual, there is another way to print out. This other method offers underlining, subscripts and so on. Unfortunately, to understand it properly, you have to consult two formidable tables in two different manuals.

Furthermore, Appendix Four discloses that you can write a little program in Basic to control printout. You have to read it carefully to understand this, however, and the appendix is not referenced by the manual's sections on printing.

I still was stumped by the problem of stopping the printer to insert new sheets of paper when outputting a long document to cut sheets. Finally, I discovered by accident that the IN-PUT command in Basic has this effect.

Thus, Radio Shack not only failed to provide formatted printout as a standard text-editing feature, but also failed to explain the printout features the machine does have.

Lee Levitt
Executive Vice-President
PR Aids
New York, N.Y.

Theory, Experience Needed

Robert J. Bauhs' letter to the editor [CW, Oct. 24] states that universities teach too much theory. He obviously does not realize that the theoretical atmosphere in a university contributes to the advancement of the computer science field. Students learn how to make use of new methods, not just to stick with old methods that were around when they went to school.

Maybe Bauhs believes that the software he has been maintaining for the last 10 years is high-quality software.

If DP managers really want to lower their high maintenance costs, they are going to have to hire people with the theory to help them write high-quality code.

I am currently a senior, and have worked summers as a programmer. Because of this, I understand that experience is useful, but by no means a substitute for a good theoretical background.

If a manager does not believe that universities are providing people with proper skills, then he should set up an internship program with a nearby university or universities. Students need both theory and experience in order to write high-quality code.

Universities should supply theory, and business should supply experience.

Steven J. Hanley
University of Wisconsin-River Falls
River Falls, Wis.

Computerworld welcomes comments from its readers. Preference will be given to typed, double-spaced letters of 150 words or less. Letters may be edited for purposes of brevity and clarity. Letters should be addressed to Editor, *Computerworld*, 375 Cochituate Road, P.O. Box 880, Framingham, Mass. 01701.

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'ODE' Package Offers Data Entry, On-Line Help For IBM Users

MONROE, Wis. — International Software Technology, Inc. has announced the On-Line Data Entry (ODE) package for users of IBM's DOS/VSE, MVS and OS/VS1 operating systems.

The ODE package, operating under CICS, reportedly offers on-line Help capabilities for all system screens, commands and functions, in addition to screen formatting and customizing capabilities. The system offers high-level screen painting technology with automatic generation of input field edits, attributes and field definitions. Attributes and field definitions can be modified or expanded using a check box technique.

The ODE package is said to feature on-line specification of table validation, range checking and check digit validation or generation. Record and batch exits are provided for validation against data files

(Continued on Page 56)

IBM Micro-Based Workstation Tied To Boeing Executive Service Via T/S

VIENNA, Va. — Boeing Computer Services Co. has announced a bundled hardware/software package based on the IBM Personal Computer and Personal Computer XT that includes upload and download capabilities to Boeing's Executive Information Service on its Mainstream-CTS time-sharing service.

EIS Microworkstation includes a full implementation of the Personal Computer and \$6,000 worth of time on Mainstream-CTS. Boeing also announced that it will make its EIS modeling language available on the recently announced IBM Personal Computer XT/370.

Users of EIS can download data for manipulation on an integrated set of Boeing software on the Personal Computer. Local facilities include data collection, editing and revision, growth projections and analysis and graphics by row and column on a color monitor.

IBM 3270 emulation is also provided.

Data may be uploaded and the EIS data base updated with facilities and security provided on the mainframe. Boeing will also offer an enhancement that enables data to be loaded from EIS into a variety of popular Personal Computer software packages via the Boeing software on the micro.

A configuration that includes a Personal Computer with 128K bytes of memory, two double-density floppy disk drives, a color monitor, graphics printer, Boeing software and \$500/mo worth of EIS processing for the first year costs \$6,600. The XT configuration includes the same peripherals, software and processing time but substitutes a 10M-byte hard disk drive and 360K-byte floppy disk drive for the two floppy drives. It costs \$8,700.

Boeing Computer Services is located at 7980-90 Gallows Court, Vienna, Va. 22180.

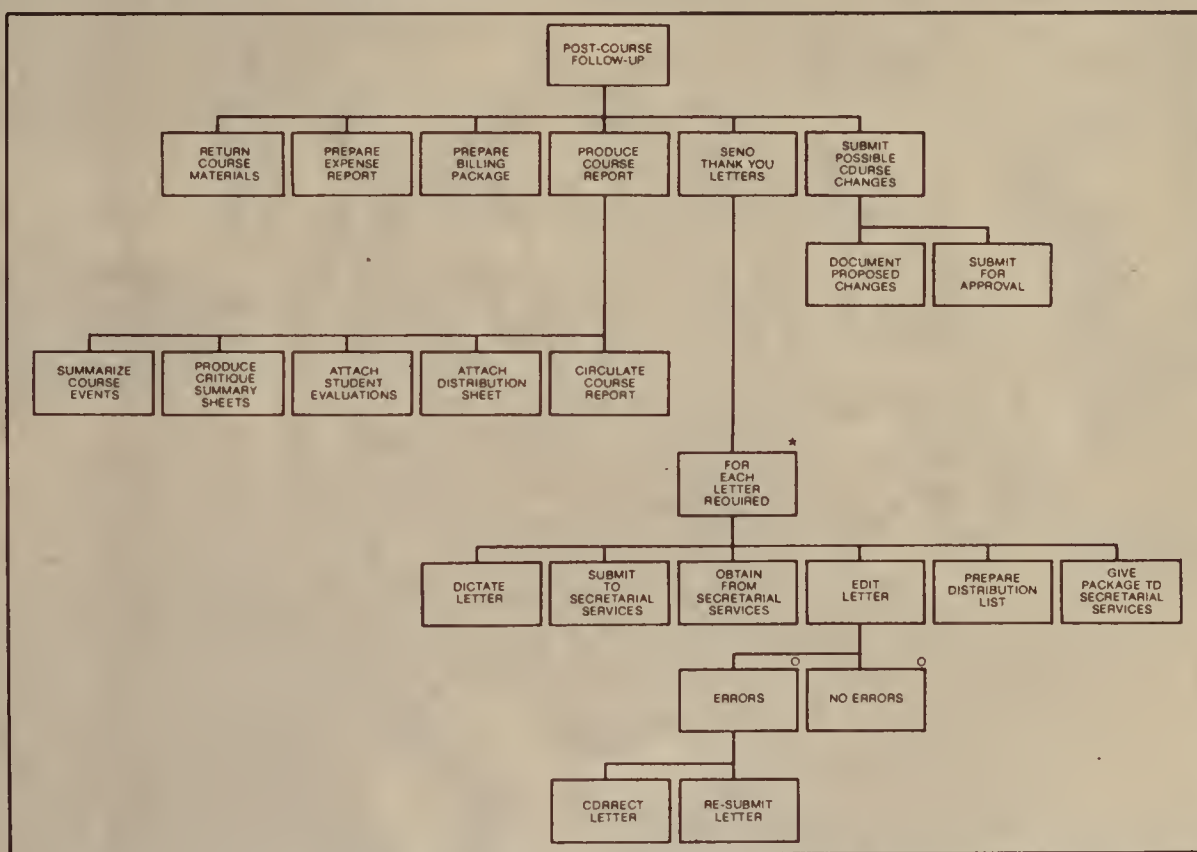
Business Analysis, Graphics Tools Debut

BURLINGTON, Mass. — Technology Information Products Corp. (T&IP) has announced a business analysis technology and graphics software tool for system development. The products help users accurately define business requirements, identify bottlenecks and functional overlaps and recommend areas of possible computer solutions, a spokesman said.

The emphasis of the modeling process is to identify business needs and then to investigate appropriate applications of computer technology. The product family also includes a program design technique and an application program generation software tool, the spokesman said. The business analysis products are requirements analysis methods that operate in conjunction with application generation tools to cover the entire information systems development cycle from requirements analysis through application program development.

The analysis technique emphasizes consistent terminology and notation. Each step of the analysis process is verified

(Continued on Page 58)



Typical Business Analysis Model

Technology Information Products Corp. Chart

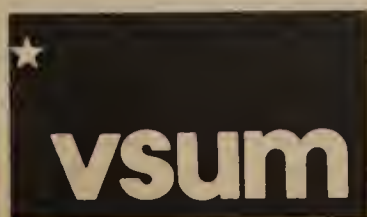
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'Megacalc' Spreadsheet Enhanced to Increase Speed

IRVINE, Calif. — The Mega Group, Inc. recently announced an enhanced version of its Megacalc electronic spreadsheet for IBM mainframe users that reportedly provides an increase of up to 200% in data input and execution speed.

The enhanced version reportedly adds 10 functions, including macro-commands, to conserve input time and stacking commands to allow pre-programming of multiple commands. The package provides user-defined single- or double-precision calculations, binary or Ebcdic file storage and sequential or partitioned data sets. It is displayable on IBM 3278 terminals I through V and all

3279 terminals, a spokesman said.

Designed for IBM mainframe users in IBM's TSO, Applied Data Research, Inc.'s Roscoe and Tone Software Co.'s Tone operating environments, Megacalc can be used on IBM 370, 4300 series, 30 series and plug-compatible systems.

A conversion utility feature allows virtually all spreadsheet models running on personal computers to be run on the mainframe and allows for uploading and downloading.

The package is priced from \$15,000, and lease prices start at \$400 a month. The Mega Group is located at Suite 100, 2091 Business Center Drive, Irvine, Calif. 92715.

'Vista' Targets Harris VOS

FORT LAUDERDALE, Fla. — The Computer Systems Division of Harris Corp. has announced Vista (VOS Integral Source Tracking and Analysis), a product for Harris' VOS that incorporates operating system technology to solve source code configuration problems.

Vista places configuration control in the operating system to improve flexibility, security and performance, a spokesman said. The software automatically establishes audit trails and historical records for software development projects running on VOS. It permits control of all software source modules during development.

Transparent support is also provided for edit sessions, multiple-level releases, concurrent development operations, project merge operations,

change control tracking, module abstracts, overviews or engineering logs. It automatically tracks information — such as the nature and content of changes, the changer's name and the date and time of the change — and includes a tracking identifier. A "historical" file automatically keeps a complete history, with all versions of the source code available. No preprocessors are needed.

For computers currently running on VOS, Vista costs \$15,000 with a \$100 monthly maintenance fee from Harris, 2101 W. Cypress Creek Road, Fort Lauderdale, Fla. 33309.

Procedure Aids Unix Installation On DEC VAX-11

FREMONT, Calif. — Voelker-Lehman Systems, Inc. has announced U/Install, an automatic procedure for installing the Unix operating system on Digital Equipment Corp.'s VAX-11 series of superminicomputers.

Loading the operating system requires inserting the operating system cassette, loading a magnetic tape and pushing a button, a spokesman said. The procedure takes about 30 minutes, during which the operator does not need to be present. The VAX prints its progress on the console.

With U/Install, the system disk is built, files are created and all pertinent information for the system is installed automatically, the spokesman said. When the procedure is finished, the system is functional and will boot from the disk.

The minimum hardware configuration on a VAX-11/750 computer is 1M byte of memory and DEC TS/TM-11-compatible magnetic tape. U/Install is included in all installations of U/OS, which is Voelker-Lehman's version of Unix. The price for a 16-user unit is \$7,500; for a 32-user unit, \$9,950; and for a 64-user unit, \$14,750. The company is located at 44160 Old Warm Springs Blvd., Fremont, Calif. 94538.

ODE Package Announced For IBM Users

(Continued from Page 55)

or to handle application requirements. ODE reportedly also features full or selective verification, visual, key or conditional verification and error correction capabilities.

According to a spokesman, when a mismatch error occurs during verification, the ODE system displays the entry and verified data, allowing the verifier to accept the entered data, accept the verified data or rekey the field. The package requires 40K bytes of resident storage, and 300K bytes of virtual memory can support up to 80 data entry terminals.

The ODE package is priced at \$12,500 and \$16,500 for DOS/VSE environments, \$18,500 for OS/VS1 environments and \$22,000 for MVS users from International Software Technology, 1112 7th Ave., Monroe, Wis. 53566.



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Cullinet has a software system that provides manufacturers with the one thing they could use more of: control.

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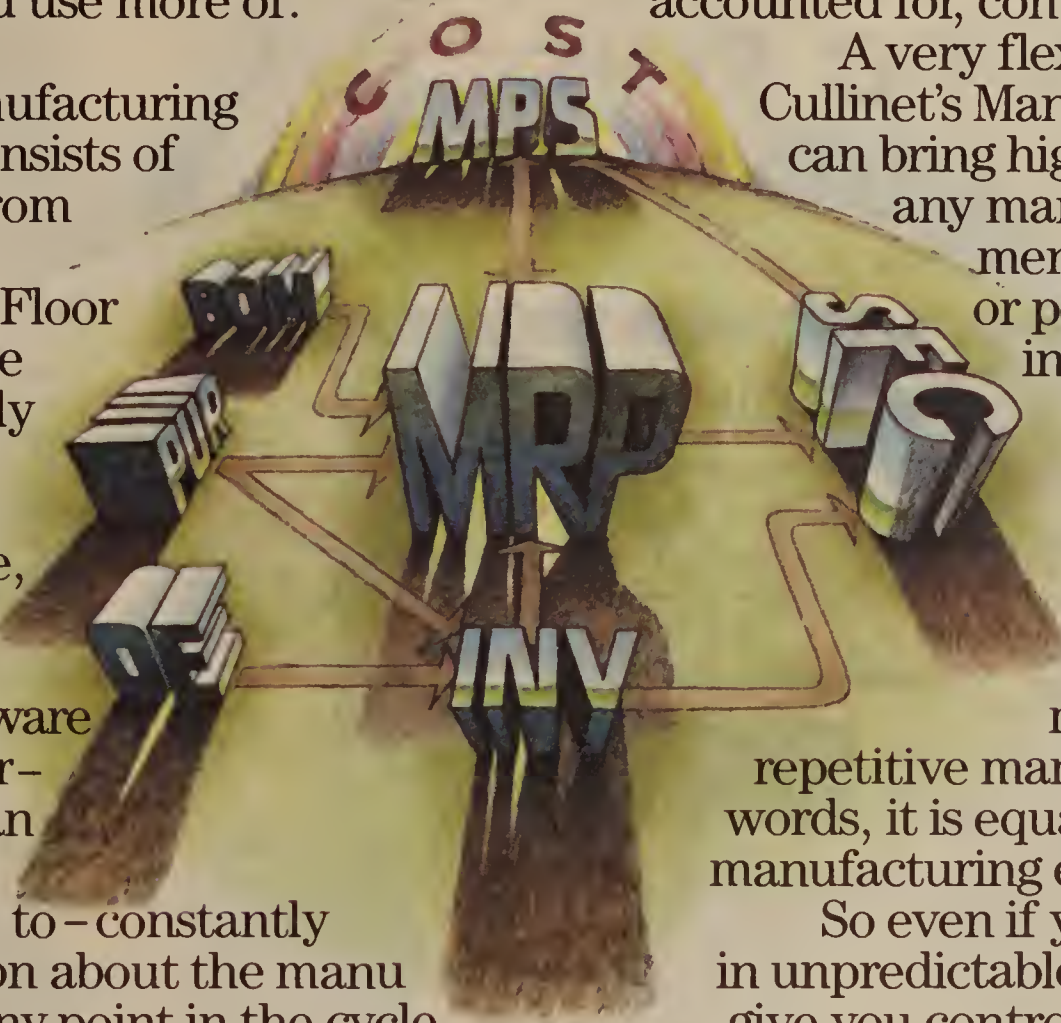
With this kind of timely information, variables that might influence inventory, resources, personnel, production, distribution, indeed, the

very profitability of a manufacturing concern can be accounted for. And, once accounted for, controlled.

A very flexible system, Cullinet's Manufacturing Software can bring high-level control to any manufacturing environment however unique or personal your individual style and approach. It can provide single or multi-plant controls. Control for process manufacturing, make-to-order, make-to-stock, or repetitive manufacturing. In other words, it is equally capable in any manufacturing environment.

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Seminars on Cullinet's Manufacturing System will be held in the following cities during the coming weeks:
Harrisburg, PA Nov. 22; Meadowlands, NJ Nov. 30; Minneapolis, MN Nov. 29; Tampa, FL Nov. 29; Valley Forge, PA Dec. 1;
Vancouver, BC Nov. 30 and Washington, DC Nov. 22. To reserve a place call Harry Merkin at (617) 329-7700.
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Liaison Series Introduced By Softech Microsystems

SAN DIEGO — Softech Microsystems, Inc. has introduced the Liaison product family, a network enhanced version of its P-system operating system, which is said to allow programs and data to be shared among different kinds of computers in a local-area network.

Disks and printers may be shared among all network users, and distributed, networking applications and special device servers may be used. Programs written for Liaison can run without change on any microcomputer in a network, a spokesman said.

The products introduced include Liaison, the P-system microcomputer

operating system with network capabilities; Liaison Disk server, a program that manages and shares disk storage; Liaison Printer Server, a program that shares one or more printers; and Liaison Tool Kit, a collection of software that can be used to develop special device servers and networking applications.

The Liaison P-system costs \$750 for up to eight users, \$2,000 for up to 24 users and \$4,000 for up to 64 users. The Disk Server and Printer Server cost \$150 for up to eight users, and the Tool Kit costs \$200 for up to 64 users. Softech Microsystems is located at 16885 W. Bernardo Drive, San Diego, Calif. 92127.

ADR/E-Mail Users Get Electronic Calendar Option

PRINCETON, N.J. — Applied Data Research, Inc. (ADR) has announced an electronic calendar and scheduling option that features time and resource management facilities for users of the firm's ADR/E-Mail. ADR/E-Mail operates on IBM and IBM-compatible mainframes under OS and DOS.

Called ADR/E-Date, the option provides users with an automatic scheduling facility, an executive-style daily calendar and the ability to inquire about other users' schedules.

According to the vendor, a user can schedule a meeting by filling out a prompt screen, which automatically generates an electronic mail mes-

sage to all attendees. By confirming attendance, each attendee's calendar is updated to reflect the meeting.

A facilities management feature ensures that the appropriate meeting facilities are available. The executive calendar feature allows each user to define his schedule in desired time blocks. A user's normal working hours can be preestablished, designating that the time available for meetings falls only within certain periods.

ADR/E-Date is priced at \$10,000 and will be available the second quarter of 1984. ADR is located at Rt. 206 and Orchard Road, Princeton, N.J. 08540.

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Waiting to give you all the capacity of the *XT at a price that saves you hundreds of dollars compared to the cost of trading up.

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Features and Benefits

- Increased capacity
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*XT is a registered IBM trademark

*DataMark is a registered trademark of Memorex

UCC Adds CTP Processing To System

DALLAS — University Computing Co. (UCC) has announced Corporate Trade Payment (CTP) processing, an addition to the Paperless Item Processing System, UCC's distribution, accounting and proof system, which provides financial institutions with an interface to automated clearing houses for electronic funds transfers.

The CTP module provides a fee-generating service to financial institutions and can process as an originating or receiving institution on the corporation's behalf, the vendor said. The module also provides an exclusive control file for CTP processing and service charge options on a corporate-to-corporate basis.

A license is \$15,000 from UCC, UCC Tower, Exchange Park, Dallas, Texas 75235.

Analysis, Graphics Tools Announced

(Continued from Page 55)

through walk-through checkpoints. The technology uses models, including hierarchies, flow diagrams and matrices to define, document and analyze an organization's data and functional requirements and to form an information base for both business and computer application solutions. It also instructs the analyst how to interview personnel and organize information in diagrams.

The analysis software tools help the analyst develop diagrams and models through a menu-driven system that provides diagrammatic structures for the data as well as keyboard functions for manipulating and editing the diagrams.

T&IP's business requirements analysis technology and its accompanying software are available for medium- to large-scale IBM and compatible systems. The technology and software can be purchased for \$120,000. The entire T&IP product family is available for \$150,000. T&IP is located at 12 New England Executive Park, Burlington, Mass. 01803.

MSA software makes your mainframe computer work 100 times harder than ever before



1. Now MSA's Executive Peachpak II™ software links personal computers to the mainframe. So you can...



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3. Access entire mainframe files, so you can work with large amounts of information at one time.



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7. Plug PCs directly into your existing online network...



8. Or establish dial-up access with regular telephone lines.



9. Interface mainframe data directly to typewriters, graphics plotters, and printers...



10. And automate your office economically.



11. Get this new technology in any of three specific packages...



12. Give executives the management tools they need with Executive Peachpak II...



13. Provide word processing and mainframe access to administrative assistants with Administrative Peachpak...



14. Give the graphic arts department direct mainframe access with Graphics Peachpak.



15. Save time because mainframe data is automatically loaded into your PC...



16. So you free up data processing resources...



17. And you don't have to key in data yourself.



18. Use MSA's Manufacturing System data to produce a cost/margin analysis with PeachCalc...



19. Make a capacity analysis using a PC and mainframe manufacturing information...



20. Summarize your findings in a report using PeachText...



21. Eliminate spelling errors with a built-in Spelling Proofreader.



22. Analyze overtime percentage on your PC, using data from MSA's Payroll/Personnel System...



23. Make timely manpower adjustments to maximize productivity...



24. And revise departmental salary projections on your PC.



25. Download vendor history from MSA's Accounts Payable System...



26. And use PeachCalc to do comparative analysis.



27. Use PeachLink to download information from both MSA and non-MSA online mainframe systems...



28. Create custom online formats with Easy-Screen™.



29. Or use standard formats provided by MSA.



30. Download a financial report from the mainframe to your PC...



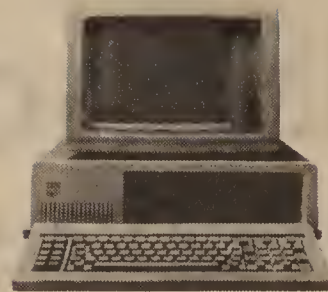
31. Add footnotes to a balance sheet using PeachText...



32. Project next month's income with PeachCalc...



33. Change sales estimates and recalculate income projections instantly.



34. Download names and addresses from your mainframe...



35. Use the List Manager and PeachText to do a mailing informing customers of a special announcement...



36. Or create a mailing to vendors requesting bids.



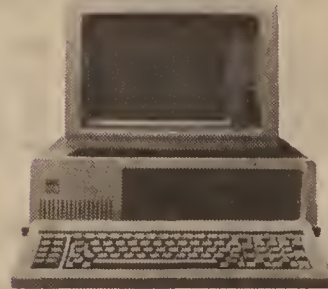
37. Using personal computer telecommunications, access up-to-the-minute exchange rate information...



38. Use PeachCalc for float analysis...



39. Display current exposure with a graph...



40. Update MSA's mainframe Foreign Exchange System.



41. Use PeachLink to distribute mainframe data to your other offices across the country...



42. Use a PC at those remote locations to print reports...



43. Graph expenses by location, department or by a single product line...



44. Print checks in remote locations from mainframe Accounts Payable data.



45. Create a salary administration worksheet on a PC using MSA's Payroll/Personnel System...



46. Produce a workforce utilization model using PeachCalc...



47. Monitor turnover using Business Graphics...



48. And, for a printed copy, route your Business Graphics output to a plotter or printer.



49. Use PeachLink to get economic data from MSA's Forecasting and Modeling System...



50. Use PeachText to prepare a corporate planning policy document...



51. Refer to a built-in Random House® Dictionary while writing the report.



52. Link to mainframes under operating systems OS, DOS, and SSX...



53. Use all standard online monitors, including CICS, IMS-DC, IDMS-DC, TSO, CMS and ICCF.



54. Assist your auditors by giving them access to mainframe data...



55. And the convenience of PeachText word processing...



56. Give them access to current customer and vendor information for letters of confirmation...



57. And an easy way to prepare notes to consolidated financial statements using PeachText.



58. Extract delinquent customer invoice information from your Accounts Receivable System...



59. Personalize a dunning letter with your micro software...



60. For help, call up 30 synonyms instantly using PeachText's Random House® Thesaurus.



61. Use mainframe Inventory and Purchasing data to graph inventory use by department on your PC...



62. Make a purchase order adjustment without leaving your workstation.



63. Download current balances from General Ledger to graph actual vs. planned...



64. Do a breakeven analysis by department.



65. Analyze overtime percentage by department on the PC using MSA's Payroll/Personnel System...



66. Use PeachText to prepare a memo summarizing your analysis and attach it to a graph.



67. Download employee data for an upcoming salary review...



68. Complete the salary review on your PC...



69. Enter the salary adjustment from your PC to the mainframe...



70. Make salary projections on your PC using mainframe payroll data.



71. Capture data from MSA's Fixed Assets System...



72. Use PeachCalc to create a lease amortization model...



73. Perform a TEFRA depreciation analysis.



74. Get database-to-database transfer with Database Sharing...



75. Download an entire report with the touch of one key...



76. Access it instantly, without data processing involvement...



77. Enjoy a realtime environment, no waiting for batch processing.



78. Access available funds data in MSA's Budgetary Control System...



79. Use PeachCalc to project expenditures through year-end.



80. Download data from MSA's Capital Expenditure Tracking System...



81. And analyze cash flows for an investment analysis decision.



82. Dial up subscriber databases to access current credit information for customers...



83. Use PeachCalc to analyze information and set credit limits...



84. And update your mainframe Accounts Receivable data.



85. Allow only authorized personnel access to the mainframe, due to built-in security.



86. Instantly express numbers in bar, line and pie charts or other business graphics.



87. Add footnotes to mainframe reports, or customize mainframe documents.



88. Produce up to nine different kinds of graphs and charts with mainframe information.



89. Get HELP if you need it, with a built-in feature that guides you through the system.



90. Organize your information and mailing lists with your own List Manager.



91. Use mainframe information with the Business Graphics System to produce slides and transparencies.



92. Work productively at home, by dialing up the mainframe from your own personal computer.



93. Make late changes to reports generated on the mainframe.



94. Do budget forecasting using PeachCalc and your PC.



95. Review profit and loss statements at a moment's notice on your PC.



96. Improve the productivity of your staff with simple-to-use software for personal computers...



97. Enjoy the convenience of a complete menu-driven system...



98. Use over 20 pre-defined applications from MSA.



99. Put this new technology to work for your company immediately...



100. Install it in less than one hour.

Backlogs? Rush requests? Now they're a thing of the past.

MSA's new Executive Peachpak II™ links your company's personal computers directly to your mainframe. So executives can get to vital information without waiting for print-outs.

Best of all, this hot new technology is available from MSA *right now*. (In fact, it's already working for companies across the country.)

Ideal for use with the newly announced IBM® 3270-PC

While other companies are still trying to work the bugs out of their initial offerings, MSA already has its *second* successful mainframe-to-micro product: Executive Peachpak II.

It offers such advanced features as Database Sharing, MSA's database-to-database transfer technology that lets you get all the mainframe

information you need instantly.

And a Universal Interface with most micro software packages including Peachtree Software, 1-2-3™ from Lotus, and VisiCalc™.

Executive Peachpak II also includes PeachCalc™, an electronic spreadsheet. A Business Graphics System for color charts and other graphics. Telecommunications that let personal computers talk to each other—or link to resources such as Dow Jones News/Retrieval®. PeachText™, a complete report production system that lets executives edit and footnote reports. A List Manager for organization. And PeachLink™, the software that links your PCs to the mainframe.

This mainframe-to-micro technology is also available in two other packages: Administrative Peachpak, which includes comprehensive word processing functions. And Graphics Peachpak, for color graphs and charts.

MSA's revolutionary new link means you

can now deal with one software company that supplies all the advanced mainframe and micro systems your company needs. And the software that links them together.

Free personal computer...

...with your qualifying purchase of MSA mainframe software and Executive Peachpak II.

For details on how to get your free personal computer contact Robert Carpenter at (404) 239-2000. Or write "Free Computer Offer," Management Science America, Inc., 3445 Peachtree Road, N.E., Atlanta, Georgia 30326. This offer expires December 31, 1983, so act today.

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Executive Peachpak II and PeachLink are trademarks of Management Science America, Inc. PeachCalc and PeachText are trademarks of Peachtree Software, Inc., an MSA company. DIF is a trademark of Software Arts, Inc. 1-2-3 is a trademark of Lotus Development Corp. VisiCalc is a trademark of VisiCorp, Inc. Random House is a registered trademark of Random House, Inc. Dow Jones News/Retrieval is a registered trademark of Dow Jones & Company, Inc.

Distributed Resource Planning Tool Offered

LEXINGTON, Mass. — A multi-level package for large manufacturing and distribution companies has been announced by Distribution Management Systems, Inc. (DMS). Called the DMS-1800, the distribution resource planning package is said to improve demand forecasting, purchasing, production planning, finished goods inventory management and transportation scheduling operations.

The package is written in Ansi Cobol and is designed to run on IBM 4300 series and 30 series mainframes utilizing data on customer orders and warehouse inventory levels provided by the DMS-1000 distribution system or the DMS-1500 warehouse management system or both. The

system can be purchased to operate entirely in batch mode or in batch with on-line inquiry and transaction entry functions.

The DMS-1800 system consists of four modules: forecasting, strategy, planning and execution. The forecasting module establishes estimates of product demand at each level of a distribution structure, based on historical order data. It then periodically monitors actual demand vs. forecasted demand.

The strategy module utilizes product information and historical demand data to compute and control safety stock and economic replenishment quantities at all locations in the distribution chain.

The planning module can generate overall production and distribution plans based on the data developed by the forecasting and strategy modules.

The primary function of the execution module is to provide a flow of

information back to management on the effectiveness of the production and distribution activities.

The complete system, with on-line capability, is priced at \$182,000. The forecasting module can be purchased separately for \$67,000 for batch or \$75,000 for batch and on-line. The strategy, planning and execution modules can be purchased as a combination package for \$115,000. DMS is located at 81 Hartwell Ave., Lexington, Mass. 02173.

Subcheck Release 1.0 Supports 'JCL-Check'

SAN JOSE, Calif. — Triangle Software Co. has introduced Subcheck Release 1.0, an optional feature for the

vendor's JCL-Check systems utility package.

JCL-Check is a systems utility that

detects and diagnoses all job stream Job Control Language (JCL) errors and many run-time abend situations before the job is submitted for test or production runs.

With Subcheck, JCL-Check is automatically invoked when the user enters a Submit command. JCL-Check validates the file being submitted and reports all errors back to the operator at the terminal.

Errors that are found are identified clearly and must be corrected before the job can be submitted. If the file is clear of JCL errors, it is automatically submitted.

With Subcheck, the user cannot bypass JCL-Check, thereby enforcing standards in the data processing operation, the vendor said.

JCL-Check runs on any IBM or IBM-compatible mainframe under OS/VS or VM/CMS operating systems and licenses for \$15,500. Subcheck is an optional feature licensing for \$1,500.

More information is available from Triangle Software at Suite 108, 4340 Stevens Creek Blvd., San Jose, Calif. 95129.

Cobol Analysis Included In 'Abstract/38'

WHEELING, Ill. — Advanced Systems Concepts, Inc. (ASC) has enhanced its Abstract/38 documentation system for the IBM System/38 to include Cobol source-code analysis. A previous version of the product provided source-level analysis of RPG and Control Language programs.

Abstract/38 records all program-described data base usage by Cobol programs, including file record layouts and field usage information, a spokesman said.

Program-level documentation includes program flowcharts, procedure explosion reports and inquiries, "where-used" listings, sample report outputs and source-code listings.

Data base information is reported for both external file descriptions and internally described program descriptions. Data base structures are referenced in file dependency reports and usage reports. Abstract/38 provides information on data base command usage, file overrides, usage of the reformat command and file and member management.

Abstract/38 is available for a one-time license fee of \$1,000 from ASC, 1084 Cornell, Wheeling, Ill. 60090.

VM Information Center Developmental Center

VM Software Shopping Center? [Great Idea!]

If you've considered implementing an Information Center or Development Center under VM, you've discovered two things:

- 1 VM can't be matched, for fast interactive response time, flexibility and user friendliness. It's a *great* product from IBM!
- 2 System software products to help you manage your VM Center just aren't available from your traditional DOS/MVS software vendors, nor from IBM.

Welcome To The VM Shopping Center

VM Software, Inc. has exactly the software products you need, to be effective with VM from the start. As much or as little as you need. From the undisputed leader in VM products.

VMBACKUP

- Saves up to 90% of time by dumping only changed data
- Dumps all data—both CMS and non CMS
- Protects tapes and saves space with multivolume SL tapes
- File, minidisk, and full pack restores done easily
- Full screen restore, standalone restore, and more

VMACCOUNT

- Complete collection, costing, and reporting online
- Flexible algorithms, account structure, and displays
- Project accounting, Product accounting, budget cutoff and more
- Capacity planning

VMARCHIVE

- Saves space by moving utilization data to tape or disk in compressed format
- Complete audit trail of activity

VMTAPE

- Provides flexible control by managing any number of tape volume series and tape drives
- Supports SL tape usage
- Eliminates operator tasks
- Full DOS/VSE guest support

VMLIB

- Shared file facility for CMS
- Saves space (usually 50%), provides auditability and version tracking
- Allows synchronization of source and object code
- Interface to DOS and OS systems

VMSECURE

- Comprehensive security for VM
- Comprehensive directory management allowing user group space and resource administration
- Permits encryption of data with no source code changes
- Simple end user command language

VMSCHEDULE

- Permits users to schedule their virtual machine on any basis
- Allows load balancing of CPU by permitting events to be run in off prime
- Serves as substitute for CMS BATCH
- English language commands

If your needs change later, or if you don't like the way we implement something (it happens), turn in one product for a different one at no extra charge. (Even one of the new ones we're planning). Now, what could be fairer than that? We're good, we know we're good, so we take a little risk.

More than 600 of the largest companies in the world are already using our VM products including 35 of the Fortune 50. (We won't tell whether number 38 is on the list). That's because we offer the best VM products available—anywhere. Call us, write us, but if you're looking at VM, you can't afford to ignore us.

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Phone (____) _____
CPU: _____

1-CW-11-83

Said to Reduce Installation Risks

IBM Announces Access to 'Copics' Products

TAMPA, Fla. — IBM's Information Network has announced TRY-Copics, a service that provides access to any of IBM's Communication-Oriented Production Information and Control System (Copics) family of products.

The service reduces the risk of

new installations, simplifies the Copics test environment, reduces new hardware requirements before product use and shortens the implementation cycle, a spokesman said.

Users can interactively access Copics data, execute batch jobs, tailor the provided Copics function and

test those modifications. Offered under the VM Productivity System (VMPS), TRY-Copics provides the user with a "fill-in-the-blanks" set of dialog panels that assist in program execution and testing.

Copics on-line transactions may be executed using the Copics sample data bases. The initial selection of products may be changed. Dialogs are provided to allow the user to refresh the data bases with the initial sample data bases.

Each TRY-Copics account is provided with a set of DOS program libraries and data bases. The supplied Copics programs may be copied into the user's library and modified. The

user may also add personally developed programs.

Batch jobs may be submitted to build tapes containing copies of the data bases and any programs or modifications that have been made. The data bases can be dumped in IBM DL/1 Unload format, Vsam Export format or Vsam Repro format.

TRY-Copics charges are the same as standard VMPS charges, which are based on usage. In addition, there is a monthly charge of \$2,000. The charge is waived when consecutive payments equal \$10,000. The IBM Information Network can be reached through P.O. Box 30104, Tampa, Fla. 33630.

Electronic Spreadsheet Runs on Prime Series 50s

SCHAUMBURG, Ill. — Advent Online Knowledge, Inc. has introduced an electronic spreadsheet program that will run on any Prime Computer, Inc. Series 50 computer.

AOK-Calc tasks involve jotting down numbers in rows and columns, making changes in assumptions or data, doing further computations and charting figures into bar graphs. The program will run without the support of any separately priced Prime software, a spokesman said.

Using Prime's Primos operating system, a single copy of AOK-Calc can be used by all users simultaneously without degrading operating system performance, the company claimed.

Features of the program include a built-in help menu with a help message for each command; maximum column width of 30 char./col.; independent adjustment of column width; an extensive array of display attributes; and the ability to consolidate numbers from an unlimited number of files.

A one-time licensing fee for an "execute-only" version of AOK-Calc is available at \$1,495. As of Jan. 1, the price will be \$1,995. Advent Online

Knowledge is located at Suite 133, 1305 Wiley Road, Schaumburg, Ill. 60195.

'Scribe 11' Out For Applications On DEC PDP-11s

BELLEVUE, Wash. — Westec Associates, Inc. has announced the Scribe 11, which the company described as an application development system for use with Digital Equipment Corp.'s PDP-11 processors in the RSX-11M or RSTS/E operating system environment.

The Scribe 11 reportedly utilizes the full set of graphics capabilities offered by DEC's VT 100 terminals, including the Advanced Video Option. The system is said to allow for the generation of application screens, and specialized coding is eliminated through single-instruction cells.

Scribe 11 offers more than 40 macro routines, including cursor control, line and screen erasing, tab setting, keypad selection, histograms, bar charts, special graphics characters, screen modes and scrolling.

The vendor said the package can be used to write form management, word processing, spreadsheet and graphics software programs. It is available for \$995 from Westec Associates, Suite 108, 1607 116th Ave. N.E., Bellevue, Wash. 98004.

It took us five years to develop the best disk/tape manager.

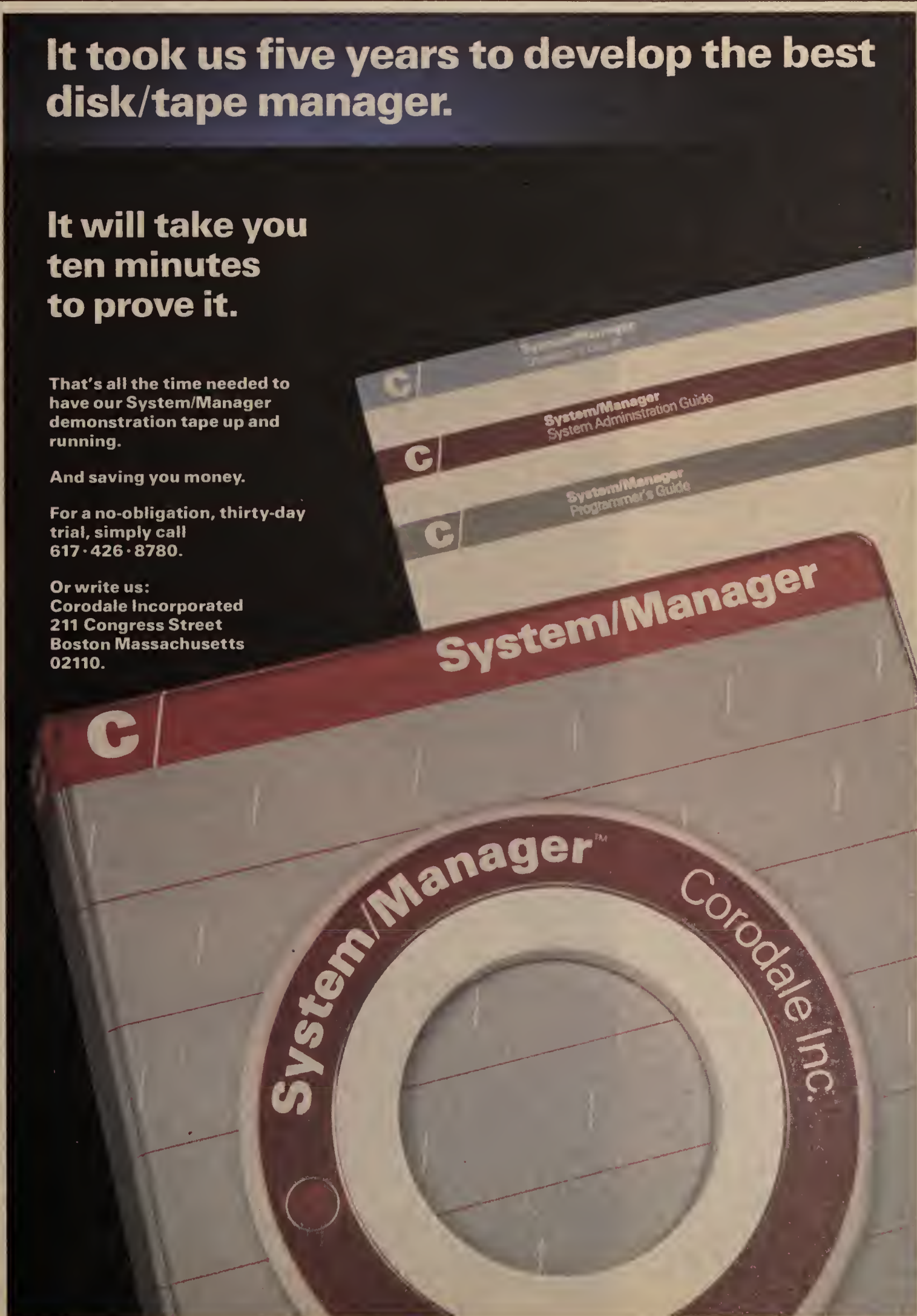
It will take you ten minutes to prove it.

That's all the time needed to have our **System/Manager** demonstration tape up and running.

And saving you money.

For a no-obligation, thirty-day trial, simply call 617-426-8780.

Or write us:
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211 Congress Street
Boston Massachusetts
02110.



Stand-Alone Provides Protection Of CICS Storage

NEW YORK — Information Technology Corp. has introduced Trak, a stand-alone CICS storage protection system.

According to the vendor, Trak operates independently of CICS program testing systems. It increases the uptime of any CICS production or test system by preventing programs from overlaying storage areas critical to the integrity of CICS, a spokesman said.

Trak was designed to be totally compatible with IBM's Extended Diagnostic Facility (EDF). The system monitors programs for storage violations while allowing the same programs access to shared storage areas. This mode of operation can be invoked without specifying the range of storage addresses to the Trak system.

Trak storage protection may be invoked for a single terminal, all terminals including nonterminal-oriented tasks and systemwide for only those terminals running EDF.

Trak intercepts software storage violations before they occur, prevents programs from executing invalid branches, traps invalid instructions and automatically protects programs running under EDF.

It is available for \$4,000 from Information Technology at 322 W. 57th St., New York, N.Y. 10019.

ACT Arm Aims Mumps System At DEC Micros

NEW YORK — Advanced Computer Techniques Corp. (ACT) has introduced a Mumps multitasked operating system for Digital Equipment Corp.'s Professional series of microcomputers. The system is available from Creative Socio-Medics Corp. (CSM), the medical division of ACT.

Dubbed SMM300, the basic system supports up to three users. With the inclusion of a real-time interface board, a total of five simultaneous users can be supported.

SMM300 was developed to run on DEC's Professional 325 or 350 personal computer as a dedicated software system. It was designed for those who wish to run a multiuser-based management system, a spokesman said.

The SMM300 provides a compatible environment for CSM's standard Mumps financial management, medical practice and other standard Mumps application programs. Software for word processing, spreadsheets and graphics running under SMM300 is also available through CSM.

A single license for SMM300 is priced at \$1,400. The product is available through an exclusive U.S. distributor agreement with Structured Data Systems, the developer of the system. CSM is located at 16 E. 32nd St., New York, N.Y. 10016.

Moves Files Automatically

File Allocation Utility Out for CICS

PARSIPPANY, N.J. — The Matlen Silver Group, Inc. has introduced Dale, a dynamic file allocation utility for CICS that automatically allocates

and deallocates on-line application files.

The 3270 menu-driven display screens facilitate the control and

management of all user data sets, including Vsam and IBM's DL/1. Data sets are managed on an ongoing basis when accessed by the application programs, the vendor said. Dale is said to increase CICS uptime, minimize on-line/off-line data base conflicts and provide more flexibility for applications development groups.

The product is available for IBM operating system environments with CICS/VS 1.5 and Basic Mapping Support. It is priced at \$3,500 per site, with a \$525 per site annual maintenance fee.

Matlen is located at Suite 306, Littleton Plaza II, 119 Littleton Road, Parsippany, N.J. 07054.


VM Software Introduces Release 3.0 Of Memory Backup-Restore System

VIENNA, Va. — VM Software, Inc. has introduced VM Backup Release 3.0, a virtual memory backup-and-restore system.

A spokesman said the new release includes 60% faster physical dumps, tape pool management, validation of

CMS files, catalog management and stand-alone restore utility to provide emergency restore capability.

The system is priced at \$9,000 for a permanent license from VM Software through P.O. Box 985, Vienna, Va. 22180.



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'Epic/VSE' Manager Backs DOS/VSE, VM/CMS

IRVINE, Calif. — Tower Systems International has introduced Epic/VSE, a data set management package designed for users of DOS/VSE and VM/CMS operating environments.

According to the vendor, Epic/VSE eliminates manual data base management procedures, replacing them with a unified, interactive approach to managing, securing and reporting on all tape and disk data set resources.

The system concentrates on the management of data sets, regardless of their storage media. Most Epic/VSE capabilities are available to the user on-line from the terminal.

The system provides a method for on-line display and maintenance of Vsam catalogs. The Vsam on-line fea-

ture reduces programmer time and specification errors, facilitates maintenance functions and improves control over the content and format of Vsam reports when compared to its batch counterpart, the company

Mathematica Targets IBM XT/370

PRINCETON, N.J. — Mathematica Products Group, Inc. has announced several products for use with the IBM Personal Computer XT/370.

The Ramis II 4GL reportedly offers the same capabilities that the Ramis II DBMS provides to mainframes and enables the microcomputer to run mainframe programs without modification. It is priced at \$1,395,

claimed.

VM/CMS support provides the ability to automatically share tape drives across any mix of DOS/VSE and VM/CMS machines without operator intervention, as well as full re-

the vendor said.

The company also announced additional components, including Ramlink, which provides bidirectional data transfer for \$185; a formatted screen manager for \$285; Relate, meant for extended relational capabilities, also \$285.

Mathematica Products Group can be reached through P.O. Box 2392, Princeton, N.J. 08540.

porting on CMS tape processing.

Epic/VSE automatically allocates disk space, provides disk and tape work data sets for intermediate data storage and frees installation from making program and job control language changes to access different device types.

Lease prices start at \$550/mo; rental and perpetual license agreements are available. The vendor is located at Suite 365, 19782 MacArthur Blvd., Irvine, Calif. 92715.

IBM Extends Applications For CS 9000

RYE BROOK, N.Y. — IBM has announced new programs for its desktop Instruments Computer System 9000 (CS 9000) which extend its range of mathematical and statistical applications and increase its diskette storage capacity.

The announcements include an emulation program that enables the CS 9000 to access application programs in a host computer by emulating a 3101 Model 20 display terminal.

The new mathematical and statistical program library features 66 individual subroutines. Release 1.1 of the Computer System Operating System (Csos) provides support for double-density 5¼-in. diskettes and extends the system's multitasking capability to support up to 13 user tasks. Support for Fortran, Basic and Pascal has also been expanded, and an optional Csos Extensions program has been enhanced to provide a full-screen editor.

The enhanced operating system supports IBM Instruments' 10M-byte hard disk with the ability to attach up to four hard disks to the system. Diskette capacity is increased to 640K bytes per diskette. A new bit-mapped disk format is used for diskettes and disks; file access methods are provided; and critical file directory information is stored redundantly.

The Scientific Subroutine Library (SSL) provides 66 individual subroutines for mathematical support of statistical, linear, matrix and quadrature functions.

Prices for new, licensed program orders are: Csos Extensions 1.1, \$155; Basic 1.1, \$195; Fortran 1.1, \$595; Pascal 1.1, \$595; IBM 3101 Emulation, \$160; and SSL, \$325.

Further Information is available from IBM's Information Systems Group at 900 King St., Rye Brook, N.Y. 10573.

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Human Resource Package Designed for OS, DOS

ANDOVER, Mass. — Software International Corp. has reached an agreement in principle with Integral Systems, Inc. (ISI) of Walnut Creek, Calif., to market ISI's line of payroll and human resources packages for IBM OS and DOS operating systems. Software International will license, install and support clients directly.

The payroll and personnel system is said to provide interactive capabilities in a variety of data base management system environments, including IBM's IMS/DB and DL/1, Cullinet Software, Inc.'s IDMS, Software AG of

North America, Inc.'s Adabas and Vsam files. The products also work in communications environments including IBM CICS, IMS/DC and CMS as well as Cullinet's IDMS/DS and IDMS ADS/OL.

Technical features include expandable data bases, on-line direct update processing, on-line system security and recovery, general ledger interface and structured design. A system costs from \$80,000 to \$300,000 depending upon modules ordered and processing environment from Software International at One Tech Drive, Andover, Mass. 01810.

'CJ/Fixed Assets' System Provides HP 3000 Support

TAMPA, Fla. — Collier-Jackson, Inc. has announced CJ/Fixed Assets, an on-line, data base-oriented fixed assets accounting system for the Hewlett-Packard Co. HP 3000 computer. The product provides property depreciation facilities and is geared toward medium-size to large corporations, a spokesman said.

CJ/Fixed Assets tracks property at company, division and department levels and can create separate or consolidated reports. Users can define parameters to determine specific types of assets and sorting sequences. It also maintains data for historical reporting.

An unlimited number of books

can be kept, the spokesman said. Eight common depreciation methods are supported. CJ/Fixed Assets includes an automatic interface to the company's CJ/Advanced General Ledger and can be adapted to other general ledger systems.

The \$18,000 license fee includes object code, source code, training, installation, documentation, an implementation plan and 90-day start-up support. Collier-Jackson is located at 5406 Hoover Blvd., Tampa, Fla. 33614.

'APX II' Handles Deposits/Costs

HILLSIDE, Ill. — The Weiland Software Group, Inc. has announced APX II, which is said to increase fee income for commercial deposit account relationships by weighing deposit-earning power against cost services. The software is delivered with a new cost/price subsystem, the vendor said.

The subsystem expands the service categories to 99,999 differentiated sources, the vendor said. The system can perform "pro forma" analyses at three levels: single accounts, families of related accounts and groups of accounts.

The system was designed to run on the IBM 4300 series or larger systems in either DOS or OS operating systems. The price of the subsystem is \$45,000. Weiland Software is located at Suite 100, 240 Fencil Lane, Hillside, Ill. 60162.

Cullinet Opens Training Centers

WESTWOOD, Mass. — Cullinet Software, Inc. has announced the opening of district and regional education centers in 13 cities in the U.S. and Canada. The new education centers expand training opportunities available to Cullinet customers.

Courses offered at the education centers emphasize a "how-to-use" approach and role training for applications programmers, systems analysts, systems programmers and other data processing professionals, the vendor said.

District education centers in Atlanta, Chicago, Philadelphia and Los Angeles offer an expanded curriculum, integrating classroom instruction with hands-on computer workshops. Each district education center has on-line access through a computer laboratory to interactive training exercises developed at the National Education Center in Framingham, Mass., which opened last January.

Regional education centers in Cleveland, Dallas, Denver, Houston, Montreal, New York, San Francisco, Toronto and Washington, D.C., offer a newly expanded curriculum.

Tuition prices range from \$220 to \$750, depending on the length and subject matter of the class, from Cullinet at 400 Blue Hill Drive, Westwood, Mass. 02090.



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Package Offered for 'Mapics'

DOYLESTOWN, Ohio — Siam International, Inc. has announced the Siamgl Procedure for users of IBM's System/34 Manufacturing, Accounting and Production Information Control System (Mapics) general ledger package.

The vendor said the software provides a method of maintaining the general ledger detail lost during each end-of-month closing. The menu-driven Siamgl Procedure reportedly does not modify any Mapics codes and will save each month's detail transactions in an off-line file. The file can then be used to run a listing of the general ledger with all detail transactions listed in chrono-

logical order within account code, according to the vendor.

All detail transactions for a year can be held on a series of diskettes, which can be stored for security and audit purposes. The Siamgl Procedure is available for \$100 from Siam, 12321 Hollow Ridge Drive, Doylestown, Ohio 44230.

Book Details Mini, Micro Services

GLENVIEW, Ill. — Information Sources, Inc. has announced the *Small Systems Software and Services Sourcebook and Supplement*, a two-volume library of over 3,000 listings of minicomputer and microcomputer software and services.

Listings for each package cover such areas as which users the soft-

ware is designed to serve, equipment and operating systems, languages, availability, number of installations and cost comparisons.

A one-year subscription rate is \$125 if paid in advance and \$135 if billed later from Information Sources, 1807 Glenview Road, Glenview, Ill. 60025.

Prime 50 Series Users Get Programming Aid

Keypr system is a software development tool and text archive system. Keypr maintains a master file containing user-named blocks of code or text. Each line within a block is given its own unique identifier, providing the user with a direct method of performing random modifications. The program documents all changes automatically, providing the user with an audit trail.

Keypr may be used for most languages including Cobol, Fortran, Pascal, PMA and PL/I. The program is available now for a license fee of \$1.25 per day from Armstrong Systems House, 28635 Hazelridge Drive, Rancho Palos Verdes, Calif. 90274.

System 1032 Enhanced For VAX-11/780

CAMBRIDGE, Mass. — Software House, Inc. has announced a series of enhancements to its System 1032 data base management system (DBMS) for use with Digital Equipment Corp. VAX-11/780 computers.

Version 1.5 of the System 1032 DBMS is said to offer programming features such as the handling of Ebcidic data and an enhanced Pascal interface. The system, written in Macro, includes mid-command choice lists, help messages and instant abbreviation completion. A FOR command is said to make the System 1032's internal programming language a Pascal-like, block-structured language, and a host-language interface supports Pascal data types.

The vendor said Version 1.5 also includes on-screen reporting, wider access to VMS system data and on-line instructional demonstration. A typical System 1032 license costs \$40,000 for the VAX-11/780 from Software House, 1105 Massachusetts Ave., Cambridge, Mass. 02138.

'Emacs' Editor Expanded For Domain

HIGHLAND PARK, N.J. — Unipress Software, Inc. has announced that its Emacs screen editor software has been expanded for use with Apollo Computer, Inc.'s Domain system under both the Aegis and Aux operating systems.

The Emacs system reportedly features multiple windows that allow several files to be edited simultaneously, search and replace commands and programming aids such as automatic indenting. The system is said to communicate directly with both the Aegis and Aux systems, allowing users to execute system commands and programs from within Emacs windows and capture the output in an Emacs buffer.

The vendor said the Aux "make" function can be run from one window to compile a program, and erroneous statements will automatically be placed in another Emacs window. Emacs costs \$995 per workstation from Unipress Software, 1164 Raritan Ave., Highland Park, N.J. 08904.

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Micro Notes

Onyx Systems, Inc. recently announced a set of 11 utilities to be bundled free with purchase of its **Oasis Version 5.6** operating system, which is priced at \$850, and available by upgrading for \$95 to users of Version 5.5C and for \$150 for users of 5.5B1 and earlier versions. The company is located at 25 E. Trimble Road, San Jose, Calif. 95131.

Ashton-Tate has announced that its existing **Dbase II** package is totally compatible with the recently introduced IBM 3270 Personal Computer. A company spokesman said Ashton-Tate software specialists worked under agreement with IBM to assure compatibility of the software with the new microcomputer. Ashton-Tate is located at 10150 W. Jefferson Blvd., Culver City, Calif. 90230.

Logical Systems, Inc. (LSI) recently announced the four-package LSI Help system series, **Help, Technical Help, Help Generator** and **Help Text Source**, to provide syntax information to the user from the disk operating system level or from within most application packages. The series is available in two versions: one for its Ldos Version 5.1 used on the Radio Shack TRS-80 Models I and III and Lobo Systems International's Max-80; and another version for the Ldos/ TRSDOS 6.X used on TRS-80 Models 4, II and 12. Packages are priced from \$19 by Logical Systems through 8970 N. 55th St., P.O. Box 23956, Milwaukee, Wis. 53223.

Micro Architect, Inc. announced the **Word-X** word processor package for the IBM Personal Computer XT and compatible microcomputers. The package supports color or monochrome monitors and consists of full screen editor and text processor modules. It is priced at \$58 by the vendor, located at 6 Great Pines Ave.,

Burlington, Mass. 01830.

Advanced Software Products, Inc. announced Version 1.5 of its 3101 emulator package for the IBM Personal Computer and IBM Displaywriter, providing the ability to transfer data files during block mode emulation. Perpetual licenses are available for \$300 per system from the vendor through P.O. Box 790, Delray Beach, Fla. 33447.

Applefile III is a data management program from Apple Computer, Inc. for organization, management and maintenance of large files on its Apple III microcomputer. It enables users to store, arrange, review and print records in files that have up to 16M bytes of mass storage. It requires 256K bytes of internal memory and an Apple Profile hard disk or comparable unit. The suggested retail price is \$325 from dealers of Apple, which is located at 10260 Bandle Drive, Cupertino, Calif. 95014.

Rosen Grandon Associates has announced **A-Stat 83**, a statistical analysis and data base reporting system compatible with Apple Computer, Inc.'s DOS 3.3 and Digital Research, Inc.'s CP/M operating systems.

The software was designed for survey market research and applications. The price for the Apple II, II+ and IIe software is \$200. For the CP/M and Microsoft, Inc. MS-DOS versions, the price is \$300 from Rosen Grandon Associates, 7807 Whittier St., Tampa, Fla. 33617.

Alpine Datasystems, Inc. has announced a new version of its **Fixed Asset System** software for use with microcomputers operating under Digital Research, Inc.'s CP/M operating system.

The new version has been updated

with current government depreciation regulations, and it provides traditional calculation methods along with the Accelerated Cost Recovery System. It costs \$495 from the vendor at 8043 S.W. Cirrus Drive, Beaverton, Ore. 97005.

Omtool Corp. has developed a version of its Digital Research, Inc. CP/M 80 and CP/M 86 **Softbol** language system for Digital Equipment Corp.'s Rainbow 100 and Decmate II microcomputers. Softbol is compatible with DEC's CTS-300 DIBOL-11 language and permits business applications, including Mini-Computer Business Applications, Inc.'s software packages written in DIBOL, to run on both microcomputer systems. It is available for \$1,000 from the vendor at 212 Bacon St., Waltham, Mass. 02154.

Relational Solutions, Inc. has released **Superstar**, which allows users to select the foreground and background colors for Micropro International Corp.'s Wordstar, eliminating the hard-to-read white on black that Wordstar defaults to when used on a color monitor. Reverse video is supported for monochrome monitors. Superstar also allows the user to select default Wordstar parameters once, from a menu, eliminating the need to reset the default parameters each time. Superstar runs on any IBM Personal Computer or Personal Computer XT that uses Wordstar 3.2 or a later release and is available for \$29.95 from 8723 Woodleigh Drive, Houston, Texas 77083.

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board, five users can be supported. The system is available from Creative Socio-Medics Corp., the medical division of ACT, through an exclusive U.S. distributorship agreement with the developer, Structured Data Systems. A single license for SMM costs \$1,400 and quantity discounts are available from Creative Socio-Medics, 16 E. 32nd St., New York, N.Y. 10016.

Turbo-Pascal for IBM's PC-DOS, Microsoft, Inc.'s MS-DOS and Digital Research, Inc.'s CP/M 86 and CP/M 80 operating systems has been announced by Borland International. Named Turbo Pascal because of its speed, it is reportedly 10 to 70 times faster than Digital Research's MT and JRT Pascal. It takes 27K bytes of disk space and includes a built-in, interactive, full screen editor, which is compatible with Micropro International Corp.'s Wordstar. Turbo Pascal will sell at an introductory price of \$49.95. Marketing will be through key distributors, and Borland is accepting distributor applications at 4807 Scotts Valley Drive, Scotts Valley, Calif. 95066.

Avant Garde Creations has introduced **Amperfinesse**, an enhancement to Apple Computer, Inc.'s Applesoft Basic designed to run on the Apple II and IIe. Amperfinesse allows the user to call subroutines with arguments and by name, format numeric output, redimension arrays, chain Applesoft programs or move a program in memory while it is running. Amperfinesse can be fragmented and placed anywhere in memory, and machine language command routines can be appended to the Applesoft program, creating a package that will run on machines that don't have Amperfinesse available. It costs \$79 from P.O. Box 30180, Eugene, Ore. 97403.

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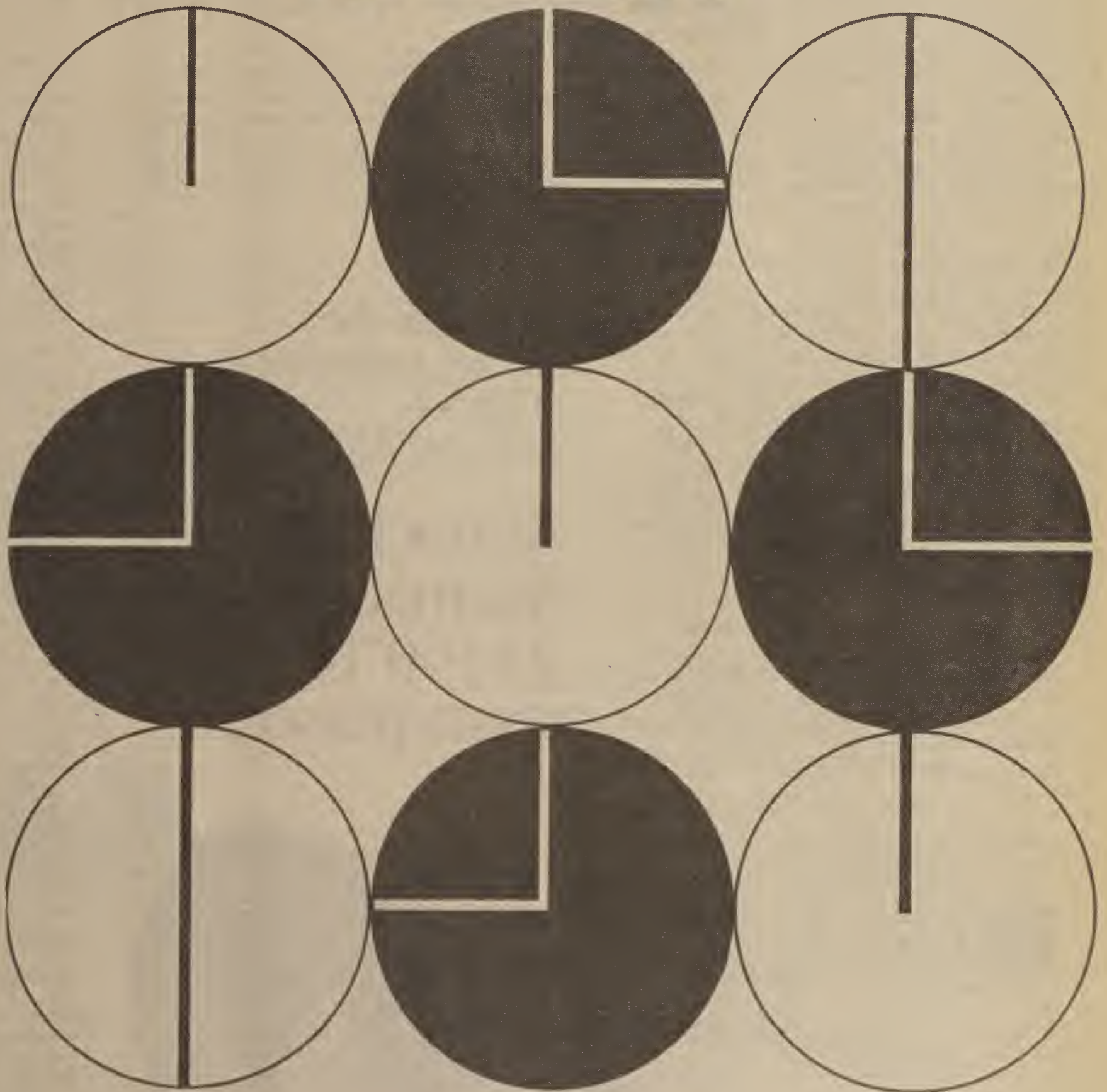
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COMPUTERWORLD

Getting the Right Things Done On Time



"Time consciousness pervades data processing," explained an MIS executive, "but time management isn't so prevalent."

"It's worse than that," a colleague responded. "We're acutely aware of time and its pressures: elapsed time during development steps, project milestones and deadlines, the effect of user impatience and lack of understanding. It's the stress that results from all these that's cutting into my effectiveness."

"What bothers me," a third manager replied, "is the trouble my newer, less experienced project leaders and managers are having managing their time. They're uncomfortable with the need to pay attention to people and really to communicate with them. It was easier when all they had to worry about were themselves and their own piece of the project. Managing others requires a different kind of time consciousness."

By Stewart L. Stokes Jr.

Organizations have personalities or "cultures" that help to influence behaviors on the job (and sometimes off the job, as well). They are often described as "the way we do things around here" and are communicated through

(Excerpted from *Time Is of the Essence*, by Stewart L. Stokes Jr. © 1983 by QED Information Sciences, Inc., 170 Linden St., Wellesley, Mass. 02181.)

IN DEPTH

action and behavior as well as words.

Organizational personalities evolve, subtly shaping the ways work gets done. The task and process dimensions of activities and objectives are molded by the strength of personality present in the particular unit or department.

The organizational personality affects the way time is used and managed in two major ways.

First, it directly affects how expectations are managed, as well as how mutual understanding of objectives, tasks and responsibilities is achieved.

An organization's personality dictates directly how time is consumed hour by hour, day by day. How is information communicated? What information is communicated? How frequent are meetings, and who schedules them?

In some organizations, the personality dictates that considerable time and attention be paid to developing a clear understanding of where the organization is going, how it plans to

get there and what everyone's contribution is expected to be. The spirit of open, up-front communication pervades the atmosphere, and people tend to have a clear conception of

their roles. There are few secrets, with politics kept to a minimum. As a matter of fact, office politics is frowned upon in such organizations, because politicking is regarded as a waste of time and energy.

Second, the organizational personality dictates directly how time is consumed hour by hour, day by day. For instance, how is information communicated? What information is communicated? How frequent are meetings? Who schedules them? Where are they held? Who is invited? Who is expected to participate and how? How long do meetings last? What is discussed? How are decisions reached? Who is involved in making decisions? What is the correlation between length of meeting and results?

In some organizations, no one would think of holding a meeting without:

- Inviting everyone who is even remotely affected by the matter at hand.
- Clearing the date and time on everyone's calendar well in advance.
- Reserving a conference room.
- Confirming the data and time in writing.

This style reflects the way things are done in a formal, structured environment and culture. In keeping with this personality, it is safe to assume that:

- There are frequent meetings.
- They tend to be long.
- A "meeting code of conduct" pervades the atmosphere, and participants are expected to follow it.
- Discussions are relatively formal and structured.
- Written agendas are circulated in advance to all attendees.
- Written agendas are followed rigorously.
- Minutes are kept, circulated and used as the basis for future action.

On the other hand, in other organizations, no one would think of setting up meetings so formally. Meetings are considered necessary evils, to be kept as brief as possible. In such organizations:

- Meetings are few and tend to be attended by only those involved in the decision.
- Meetings are organized on the spur of the moment.
- Agendas are also drawn up hastily and tend not to be circulated.
- Agendas are loosely followed and discussion is free-flowing.
- A meeting code of conduct exists, but the atmosphere tends to be more informal.
- Discussions are less formal and structured.
- Minutes are kept by those who care to keep them, but are seldom circulated, and decisions are subject to change "on the fly" as new information is received into the system.

Which style is better? It's not an either-or choice. Organizations grow their own style, and what works well for some will not work at all for others. What's important to understand is that an organizational culture is present and working and that

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managers need to understand the culture and its impact on how the time resource is handled.

Quick-and-dirty time-management tips often fail because the person trying them doesn't understand the organizational culture and its influence.

Five Time-Control Problems

Five major, universal time-control problems underlie many of the "time thieves." They are:

1. Differences in expectations; gaps in understanding; lack of mutually understood expectations.

2. Lack of information about organizational and unit objectives that affect performance.

3. Difficulty in transmitting understanding through oral and written communication.

4. Difficulty in delegating.

5. Crisis management resulting from a lack of interest in planning.

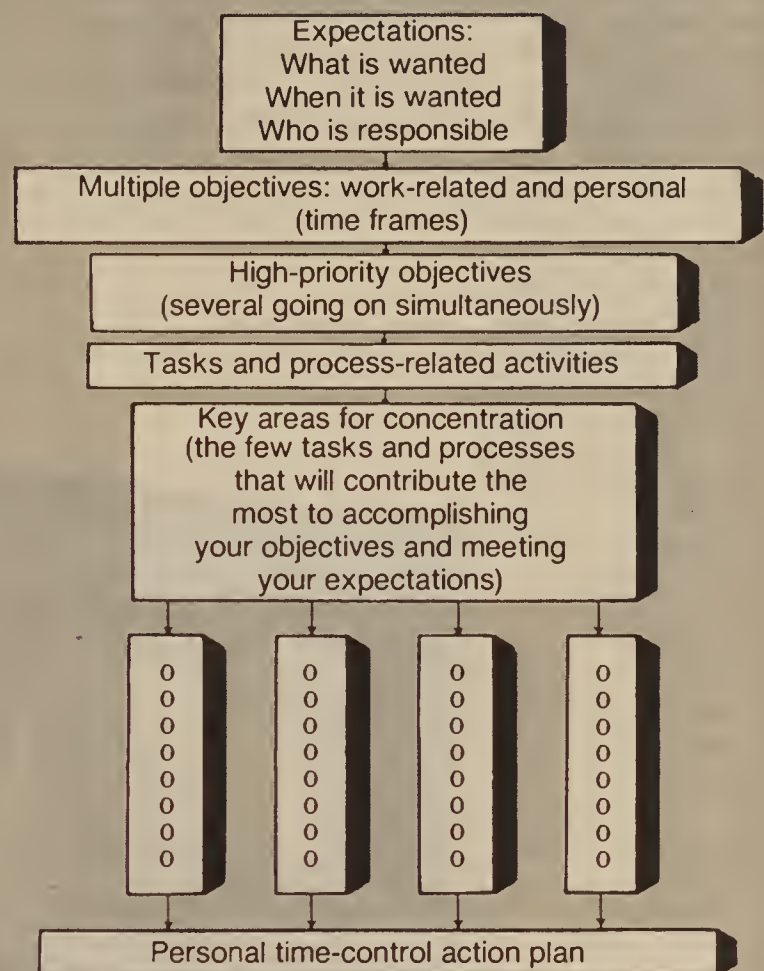
As you read about these universal time-control problems, think about how they affect you and what you can do about them. You will be able to build a more effective personal action plan for time control if you take time now to understand the problems that affect your attitudes and behavior.

A major time-control problem in organizations today is a lack of understanding about what is wanted, needed and expected. It is often assumed that everyone perceives the organization, department and unit in the same way and that everyone is traveling down the same road, toward the same objectives and with the same time-management concerns and constraints in mind. But such is seldom the case, especially in data processing, where it is well understood that the loyalties of DP professionals are often stronger to the field or profession itself than to the employer.

If you make the necessary effort to learn more about where your organization is going, you will have taken a giant step toward more effective time management — both for yourself and your unit.

A second and related universal time-control problem is a lack of understanding of organizational and unit objectives that affect individual performance. No one can manage any resource effectively (hardware, software, people, dollars, time) unless he has a clear understanding of what is expected of him, what his objectives are (task and process, quantity and quality) and what his key areas for concentration need to be.

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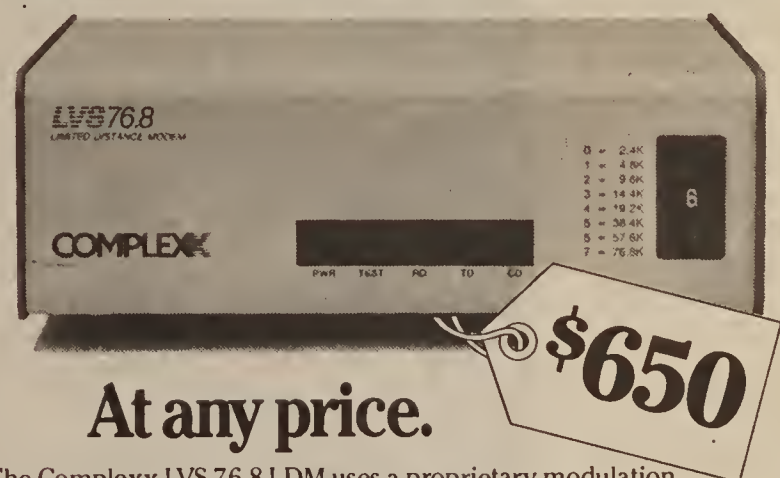
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Most people must continually seek out this information, process it, establish an organizational network and channels of communication (formal and informal) to stay up to date and make it their business to keep their personal network open and two-way communication flowing.

If you continually monitor your on- and off-the-job objectives, focus on key areas for concentration and maintain an ongoing action plan, you have all the raw material necessary to manage your time and energy more effectively. A flowchart of these foundation elements appears in the box on In Depth/3.

Poor Communication

A third problem involving time control is difficulty in gaining the understanding of others through oral and written communication. Poor communication skills account for significant time loss in just about every DP organization. This loss is visible in abnormally high costs for systems development, maintenance and operations.

You may document this time loss for yourself, with data obtained from a time log. When thinking, writing and speaking skills are faulty and mutual understanding is not checked out every step of the way, time will be misused and mismanaged.

Experience has convinced me that there are five key difficulties encountered in the communication process:

1. Failure to recognize and deal with the natural barriers to understanding that exist between all people.
2. Poor listening habits.
3. Lack of feedback when communicating orally and in writing.
4. Poorly organized oral communications.
5. Awkward written communications.

One of the most important elements in gaining understanding through communication (a "key area for concentration") is to anticipate and recognize the natural barriers between people and between groups. These barriers are a complex of cultural factors, assumptions, prior experiences, attitudes and prejudices that get in the way of understanding. Recognize them for what they are, understand that they exist, and work with them, trying to minimize their effects by knowing how subtle but far-reaching their effects are.

These barriers often result in poor listening habits. The

feelings we have about the people with whom we are communicating and the assumptions we make about them often get in the way of gaining understanding. As we strive to use time effectively during the communication process, we need to

recognize the impact (positive and negative) that our feelings and assumptions will have on the understanding we create.

It is during this process that we need to check frequently for understanding with the others involved in

the discussion. We need to check what is understood and be sure that everyone involved understands the situation in as much the same way as possible. Very often, managers and supervisors (like parents) check for this understanding by asking the

wrong question: "Do you understand?" This puts the person in a bind. If he really doesn't, he is often reluctant to admit it.

Adults don't like to admit to uncertainty about something they feel someone else thinks they should know, so



IN DEPTH

they fib a little and try to cover up this twinge of insecurity by replying, "Sure, I understand." They often get into trouble with predictable results:

"But I thought you understood."

"I did, but I didn't really

think that was what you wanted."

"Of course it's what I wanted. That's what I told you."

"That's not the way I heard it."

This typical, fractured communication often leads to fractured human relations,

too. Both communications and human relations will take a lot of time to repair.

A far better approach is to take a little extra time to check for understanding by asking, "What is it that we're going to do?" or "What is our understanding of the next

step?" or "Let's share our understanding of how we're going to proceed."

These are much more "adult" questions, and they will help the person or people involved not to be on the defensive. By checking for understanding in this forth-

right, nonthreatening way, clear channels of communication will be kept open. People will understand that open communication is expected, wanted and valued in the organization, and significant amounts of time and energy will be saved.

Another aspect of effective listening relates to the clutter and competition for attention in our everyday environments. We sometimes miss the most important dimensions of an oral communication: the tone of voice, inflection and nonverbal clues that impart meaning. There are excellent training materials, books and films available on the subject of nonverbal communication. Again, the objective in mentioning it here is to point out the amount of time that is consumed by misunderstandings. "Reading" other people is not that difficult, and the time-conscious person soon learns that the skill pays dividends.

As far as written communications are concerned, the following guidelines should result in more effective use of time:

1. Know as much as possible about your audience. (Of course, this applies to oral communication as well.) Who are they? What are their backgrounds? How much do they already know about the subject, and what do they want to know? What do they expect?

2. What are your objectives? What do you wish to accomplish with your written communication? What do you want your audience to do?

3. Keep the communication simple. Avoid flowery language.

4. Put yourself in your audience's shoes. What's in it for them? What benefits? What results? Why should they read your communication, anyway?

5. Decide which form of communication is most appropriate for your objectives: a memo, letter, report. If you want a reply, ask for it. Don't leave the reader guessing.

6. Just as you check for understanding in an oral communication, do so with a written one. Ask someone else to read it and tell you what they think you mean. Don't get hung up on your own matchless prose. You're not writing for a Pulitzer Prize. You're only trying to convey understanding to someone else, and this can be a very difficult job — so "market test" your writing.

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7. Don't be lazy. If obstacles are in the way of understanding, rewrite. I was in a manager's office not long ago, and his secretary brought him a freshly typed letter he had dictated. "What do you think of it?" he asked. "It's okay, I guess," she replied, "but you could be clearer here, here and here." After quickly scanning the letter, he grabbed for his pen. "I'll sign it and you send it. I can understand it."

One result is certain: A lot of precious time will be lost when someone tries to figure out what that man-

ager was trying to say.

One of the most important strategies for more effective use of time is to fine-tune the art of delegation, one of the most difficult managerial skills to execute well. Sloppy delegation leads to much lost time every day.

Delegation disturbs many managers because it requires them to relinquish control. Most successful managers have a high sense of personal responsibility, and this is often nurtured through close control over that sphere of responsibility.

Effective time management through delegation requires that you loosen control over your operation and encourage other people to grow through job assignments. Delegation is unsettling, because part of a manager's reputation goes with the assignment.

Of course, subordinates have not had the benefit of the same experiences, insight and knowledge. Yet, if managers are to survive as managers, they must delegate. And if subordinates are going to grow in their ability to handle managerial situations,

they must be tested in real situations. There is no alternative.

It takes time to delegate, for there is often a lot of communicating, explaining and checking for understanding. Delegation always consumes time at the outset, but effective delegation saves time in the end. It frees the manager for the tasks he should be accomplishing and gives subordinates the opportunity to develop. Delegation, in addition to being a prime training strategy, is also one of the best motivators around. Most people want to be all they are capable of becoming, and delegation is one of the best ways of "turning people on" to accomplishment.

Inadequate Planning

The fifth major time-management problem is plain lack of interest in planning — not only in sophisticated, long-range strategic planning and short-range operational planning, but also in day-by-day, week-by-week and month-by-month planning.

Lack of planning results in management by crisis. Every day is a struggle. You fall behind and never catch up. You overload your schedules and don't leave time to accomplish the truly important tasks that always come in at the last minute and are a part of managerial life in every organization.

When you don't think through and write down what you want to talk to key people about on the phone, you end up phoning the same person several times a day when a couple of calls would do.

You might drop by colleagues' offices early and often — without checking to see whether they have time at that moment to give you. You assume they have time because you do. When they "return the favor," you resent it.

A few minutes of thought, a list of key items you wish to discuss and a polite call ahead of time to arrange a meeting will earn you a friend and his attention. That touch of professionalism is sorely needed in many organizations.

Planning is a must before you use any resource. You would think long and hard about spending money without a business plan.

You should think long and hard about spending personal energy — and a part of your life — without a time plan.

About the Author

Stewart Stokes is vice-president and manager of education programs for QED Information Sciences, Inc. in Wellesley, Mass. Prior to his association with QED, he served as associate dean, School of Continuing Education, at Babson College in Wellesley.

Stokes has conducted management training and education programs for a variety of organizations including the American Association of Industrial Management, Digital Equipment Corp., Polaroid Corp. and Harvard University.†

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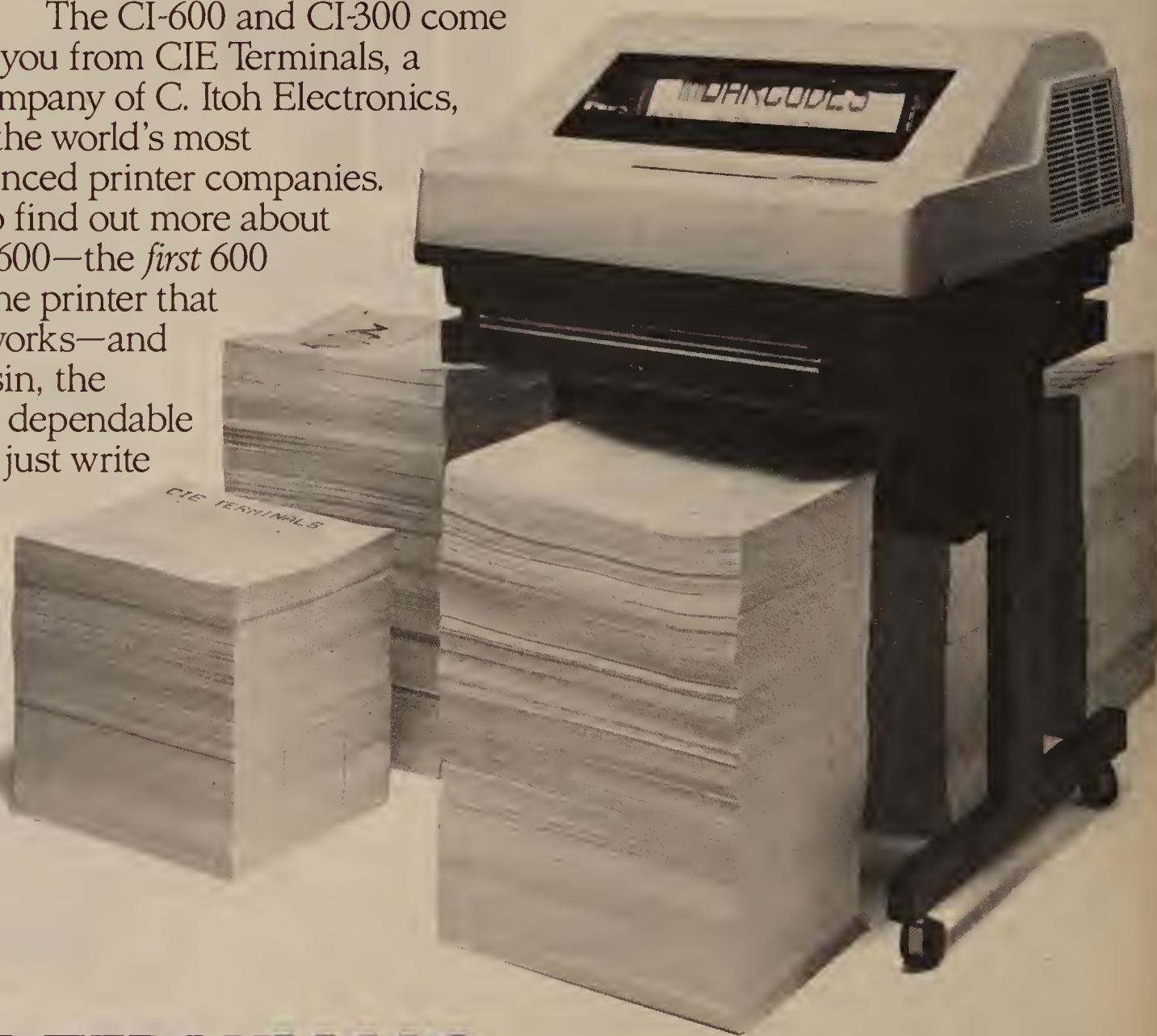
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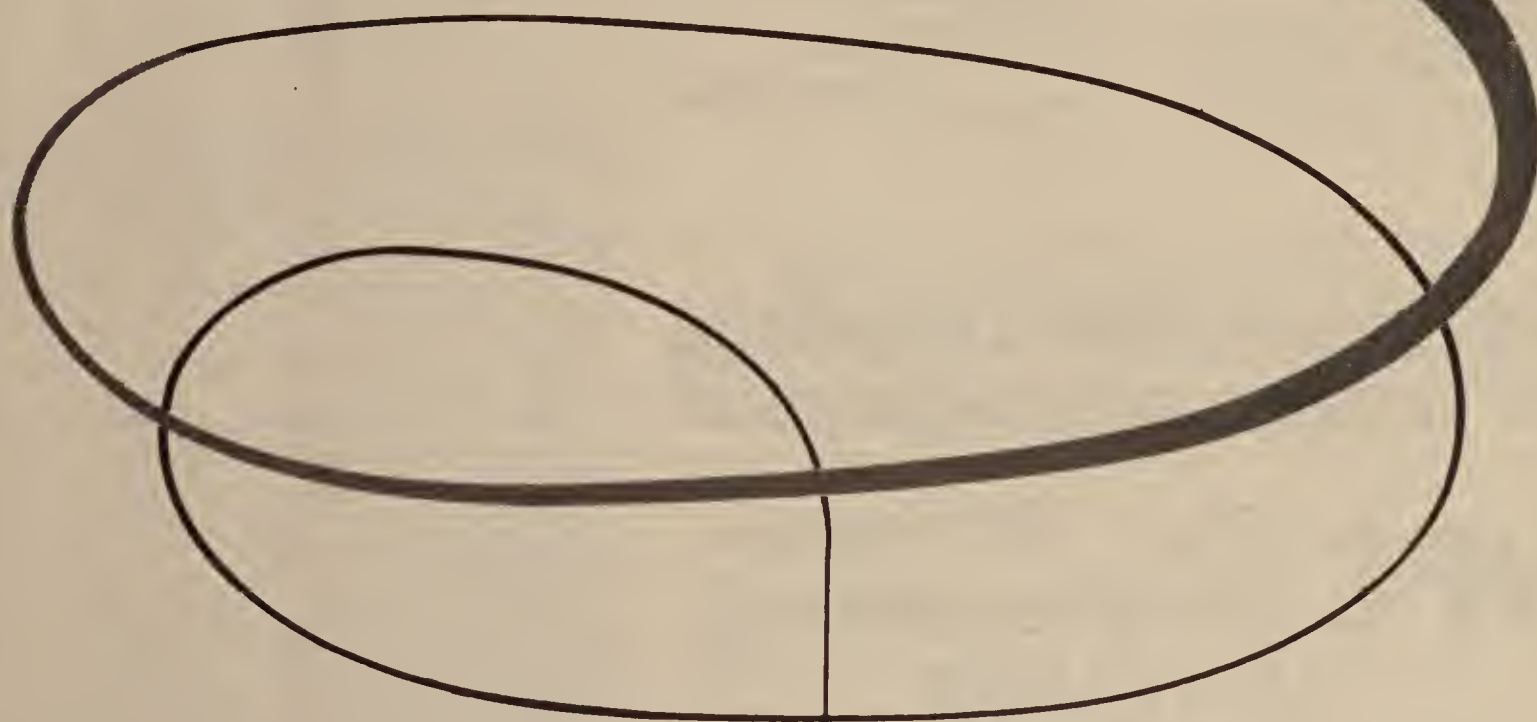
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AN SNA PRIMER FOR PROGRAMMERS *Part 2*

By David M. Baer and Jim Sturch



In the first half of this primer, we initiated the reader into the world of IBM's communications technology by discussing the evolution of Systems Network Architecture (SNA) in relation to the products that support it. Then followed an examination of some fundamental concepts and components of the architecture. In this concluding half, we delve into the details of SNA and look at how it all fits together.

For some time now, it has been clear that a preferred methodology for network communications design must incorporate the division of functions and responsibilities into layers, with the lower layer always removing some detailed responsibility from the layer above it. This philosophy is not unlike that of top-down modular structured programming, and the derived benefits are much

the same as well.

In communications between two end users, the layer approach involves the existence of two mirror images residing between them, where one of the mirror images supports each end user. Each layer in one mirror image deals only with its counterpart in the other.

There are five layers defined for SNA. The top three may be considered one "super layer" that concerns itself with management functions for the end user and the bottom two another "super layer" called the transmission subsystem. This arrangement is illustrated in Figure 2-1 (on In Depth/12). The transmission subsystem layer is responsible for physical routing of transmissions through the network, including all intermediate nodes along the route. The upper "super layer" is only required at the nodes to

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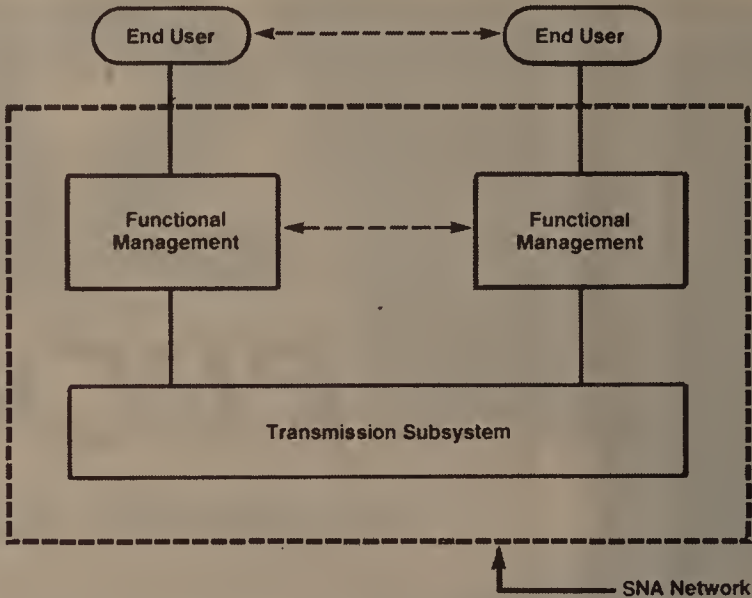
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Note that the transmission subsystem components could physically consist of many links and intermediate nodes between the end users, but the functional management components above it may behave as if their counterparts were immediately adjacent, regardless of the true configuration.

Figure 2-1. Simplified View of Layered Approach to Communications

which the end users are directly attached.

For a session between two end users, two compatible groups of processes are established in the upper "super layer"; these are known as half-sessions. A number of elements active within the half-session manage various aspects of communication; these may include Session Control, Network Control, Data Flow Control, Function Management Services (for device selection, data management, data compaction/compression and so forth) and Presentation Services (for mapping data to and from a formatted display space.)

Figure 2-2 is a more complete diagram of the layers in an SNA session. Briefly, the layers have the following functions:

- Data Link Control is responsible only for data transmission from one

node to the adjacent node and for ensuring that the data was received intact at that node.

- Path Control concerns itself with routing the data from the originating node to the terminating node, selecting the appropriate intermediate nodes along the way.

- Transmission Control acts as the interface between the upper layers of a session and the common transmission subsystem. It controls rates of data flow and manages correct sequencing of those flows.

- Data Flow Control is responsible for controlling the direction of data flow and managing various mechanisms for the logical groupings of a series of transmissions.

- High-Level Services incorporates a wide variety of functions, only a subset of which will be present for any given session. Since it is

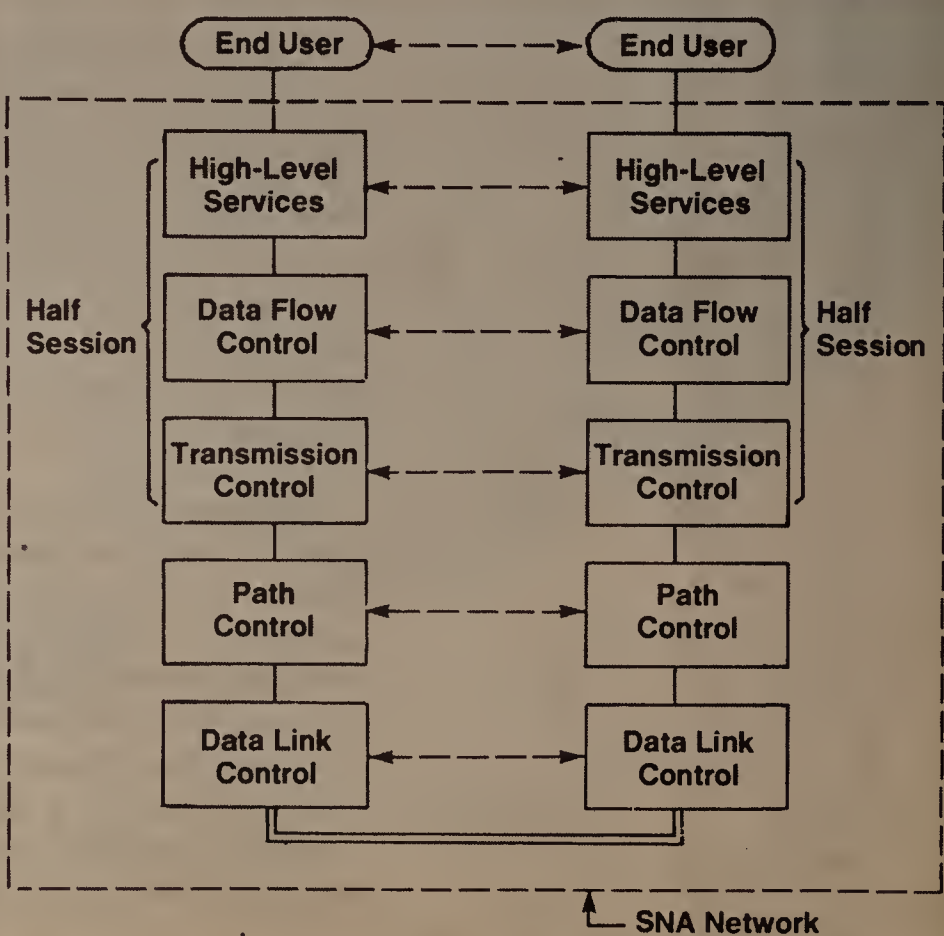


Figure 2-2. Detailed View of Layered Approach (Adjacent Nodes)

IN DEPTH

this level that directly interfaces to the end users, the specific services provided here are dependent on the nature of the session and the requirements of the end user.

Format of Transmissions

Request units (RU), whether they contain user data or network or session control commands, originate in the upper layers and are passed down through the lower layers for transmission. The three lowest layers perform a "packaging" function in which headers are added to the RU before being shipped down another layer for eventual transmission. At the receiving end, these headers are stripped as the RU is passed up through the layers.

• Upon receipt by Transmission Control of an RU or request response (RR) from Data Flow Control, a request/response header (RH) is prefixed to the RU/RR, and the result is known as a basic information unit (BIU).

• The BIU is passed down to Path Control, which attaches another header called a transmission header (TH); the result is a path information

SDLC is used to effect the serial transmission of data between adjacent nodes regardless of the transmission medium employed (analog telephone circuit, microwave and so on).

unit (PIU).

• Finally, Data Link Control receives the PIU and attaches both a link header (LH) to the front and a link trailer (LT) to the end of the BIU. The resulting basic link unit (BLU) is now ready for transmission.

Figure 2-3 diagrams the result of this process and illustrates several variations that will be introduced later. There is one subtle but important point in all this: While the three lowest levels are responsible for the construction and attachment of their respective headers, not all information used in the construction of a header resides within the layer itself; some is passed as parameters from higher levels.

This distinction deals with a level of detail somewhat beyond the scope

of this article; it is made only to avoid an erroneous oversimplification. Next will be a more detailed explanation of each of the SNA layers; the various headers will be examined more closely in conjunction with the layers that build them.

Data Link Control (DLC)

The basic job of DLC is to transmit data from one node to an adjacent node and to ensure that the transmission preserves the data's integrity. There are two types of link protocol used in SNA, depending upon whether the data link is a connection to the channel of a mainframe. A channel connection to a device like a communications controller or a local terminal cluster controller uses a channel protocol similar to that used

for I/O to other data devices peripheral to a mainframe. Since there is nothing about it unique to network communications, it is rarely mentioned in discussions of SNA, but plays an important role nevertheless.

The protocol used in SNA for non-channel connections is called Synchronous Data Link Control (SDLC). SDLC is used to effect the serial transmission of data between adjacent nodes regardless of the transmission medium (analog telephone circuit, microwave and so on) employed. Binary Synchronous Communication (BSC) was the line protocol used in pre-SNA networks, but BSC could not be carried forward into the newer architecture for several reasons:

• BSC incorporated higher session-level functions that did not really lend themselves to the SNA layered concept.

• The protocol observed by BSC utilized frequent acknowledgment transmissions, which were inappropriate for efficient satellite transmission.

• BSC protocol was dependent on the type of terminal supported.

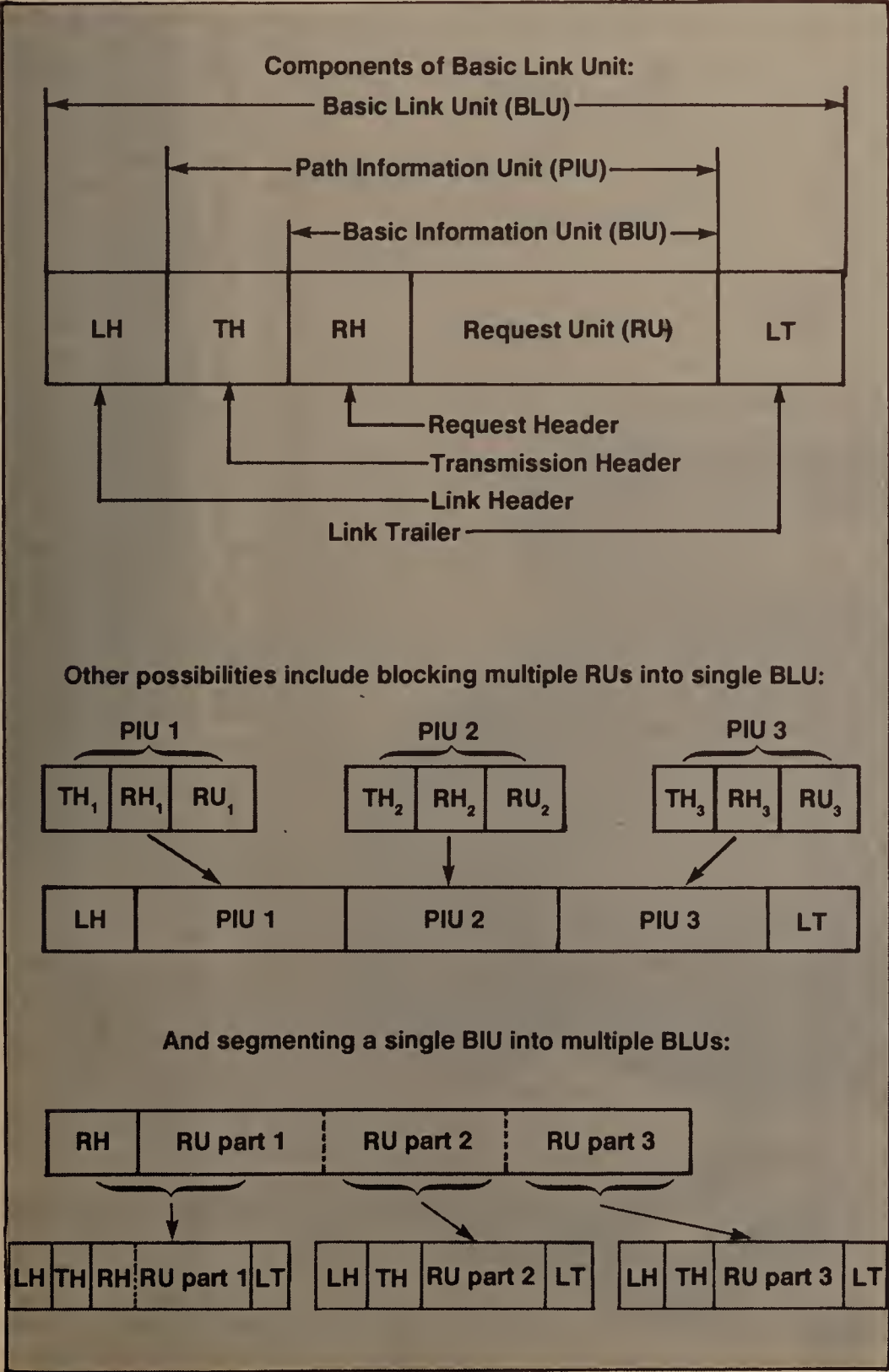
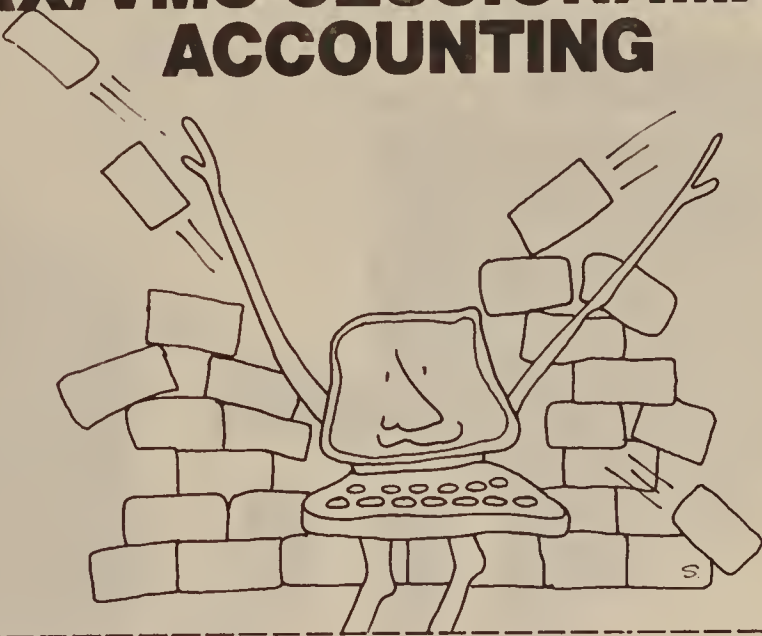


Figure 2-3. Basic Link Unit Composition

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• In general, BSC did not lend itself to networking.

SDLC was selected because it had none of BSC's shortcomings; it was a much simpler and more uniform protocol; it was suitable for satellite communications; it was a reliable mechanism for

transmission; and it permitted bit-level transparency (no special bit patterns are prohibited within the data).

A single SDLC transmission is a basic link unit, which is also often called an SDLC frame. Frames may be quite large, but in practice

are usually not longer than 256 bytes. Bit-level transparency is accomplished by beginning and terminating each frame with a flag of seven consecutive one bits. Upon transmission, any time six consecutive one bits are encountered in the data (ex-

cept within the flags), SDLC automatically will insert a zero bit. At the receiving end, any zero bit that follows six one bits is discarded. This process is known as bit stuffing. Thus, any number of adjacent one bits in the data will never appear to the re-

ceiving station as a flag terminating the transmission.

Another clever technique is used to synchronize the clocks in the sending and receiving stations. The technique, called nonreturn to zero (NRZ), alleviates the need for a separate synchronization signal between them. Every time a zero bit is sent, the polarity of the zero setting is switched. At the destination, a reverse in polarity is decoded as a zero bit, and failure to reverse polarity after a cycle is decoded as a one bit. Thus, long strings of zero bits are eliminated, and bit stuffing eliminates the possibility of long strings of one bits, so reliable synchronization is effectively built into the signal.

The link header built by DLC consists of three bytes. The first is the X'7E' flag denoting start-of-frame, mentioned earlier. A second byte is used to specify the SDLC address; it is valid only at the DLC level and should not be confused with the SNA network address. Its purpose is to identify one particular node on a multidrop line.

The third byte of the LH has three possible formats, one used for information transfer and two for SDLC control purposes. In the former, two three-bit sequence fields are maintained to record a send-count and a receive-count. The purpose of these is to ensure that the complete loss of one or more frames will always be detected. Up to seven frames can be sent before a DLC-level response specifying the last receive-count must be returned to the sending station; it can then verify that all frames have arrived at the destination.

This acknowledgment would also inform the sending station in the case one or more frames were received but found to contain transmission errors (such as might be introduced by a noisy line). The result is that the SDLC protocol can recover from most transmission-error situations without involving the higher layers at all.

The other two control byte formats are used by SDLC for acknowledgments and for link-level control commands. Regardless of control byte format, one bit is used for polling purposes; it indicates a readiness to accept data or a lack of further data to be sent.

The link trailer is also a three-byte field, the third of which is another X'7E' flag

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signifying end-of-frame. The first two bytes of the trailer are known as a frame check sequence, which is a kind of elaborate hash total of data in the frame. This total is calculated in such a way that the probability of an undetected error in a transmission is on the order of one in 10¹¹, so DLC is able to offer the upper layers a very reliable transport mechanism indeed.

Path Control

The responsibility of Path Control is routing data from its source to its destination along the appropriate path. At the originating node, Path Control accepts a request unit from the half-session above it, builds a transmission header for it, determines on which route it should go out and passes it to Data Flow Control for transmission.

At an intermediate node, the receiving Data Link Control element will strip the link header and trailer from the frame and pass the resultant path information unit up to Path Control. At that point, Path Control processes the message in the same way its counterpart in the originat-

ing node did. Finally, at the terminating node, Path Control must route the data to the half-session that is the intended destination.

Figure 2-4 shows an example of an end-to-end itinerary of a message from a host, through one 3705 to a cluster controller. The most significant difference between Figure 2-4 and Figure 2-2 is the presence of the intermediate node, which only processes the message at the two lowest layers. Upon receipt of a message at the intermediate node, Path Control will strip the existing transmission header and build a new one appropriate to the next leg of the journey.

Two other functions performed by Path Control are segmenting and blocking, which were previously illustrated in Figure 2-2. Blocking is a process of grouping multiple transmissions to be sent in a single SDLC frame; it is quite similar to the familiar method of grouping multiple records into a block for data set I/O. Segmenting, on the other hand, is similar to the spanned record recording format.

In current practice, segmentation is used far more frequently than

blocking. It is an extremely necessary technique when minor nodes with limited buffer capacities are involved. It also increases efficiency of transmission when a long RU must travel across many slow-speed links along the route, since successive segments may be traveling along different links at the same moment. Blocking, however, is an optimizing technique of somewhat limited value and is currently implemented only for transmissions between major nodes.

There are four transmission-header formats which differ primarily in the type of addressing they support. You might assume that these would be designated as TH Type 1, TH Type 2 and so on. But no, they are called format identifiers (FID) Type 1 through 4. While FID is the more commonly used term, it is synonymous to transmission header. FID types 1 and 3 are essentially older forms of network-address and local-address transmission headers and will not be discussed here.

FID 4s are used for messages between two major nodes. They contain two network addresses called

the origin address field (OAF) and the destination address field (DAF); the OAF/DAF pair uniquely identifies a session. There are also a number of shorter fields used for diverse purposes:

- Control of segmenting and blocking.
- Expedited flow control.
- Message priority.
- Pacing control.
- Message sequencing used by the higher levels for bookkeeping purposes (this is a separate sequence control from the more primitive sequencing used in SDLC).

FID Type 2s are used for the message flows between major and minor nodes. They are considerably simpler than FID 4s in deference to the limited processing capabilities of the minor nodes. They, too, contain an OAF/DAF pair, but these are local eight-bit addresses. The only other control fields are a segmenting indicator, an expedited flow indicator and a sequence number like that contained in a FID 4.

A conversion between FID types 2 and 4 takes place in the major node immediately adjacent to a minor

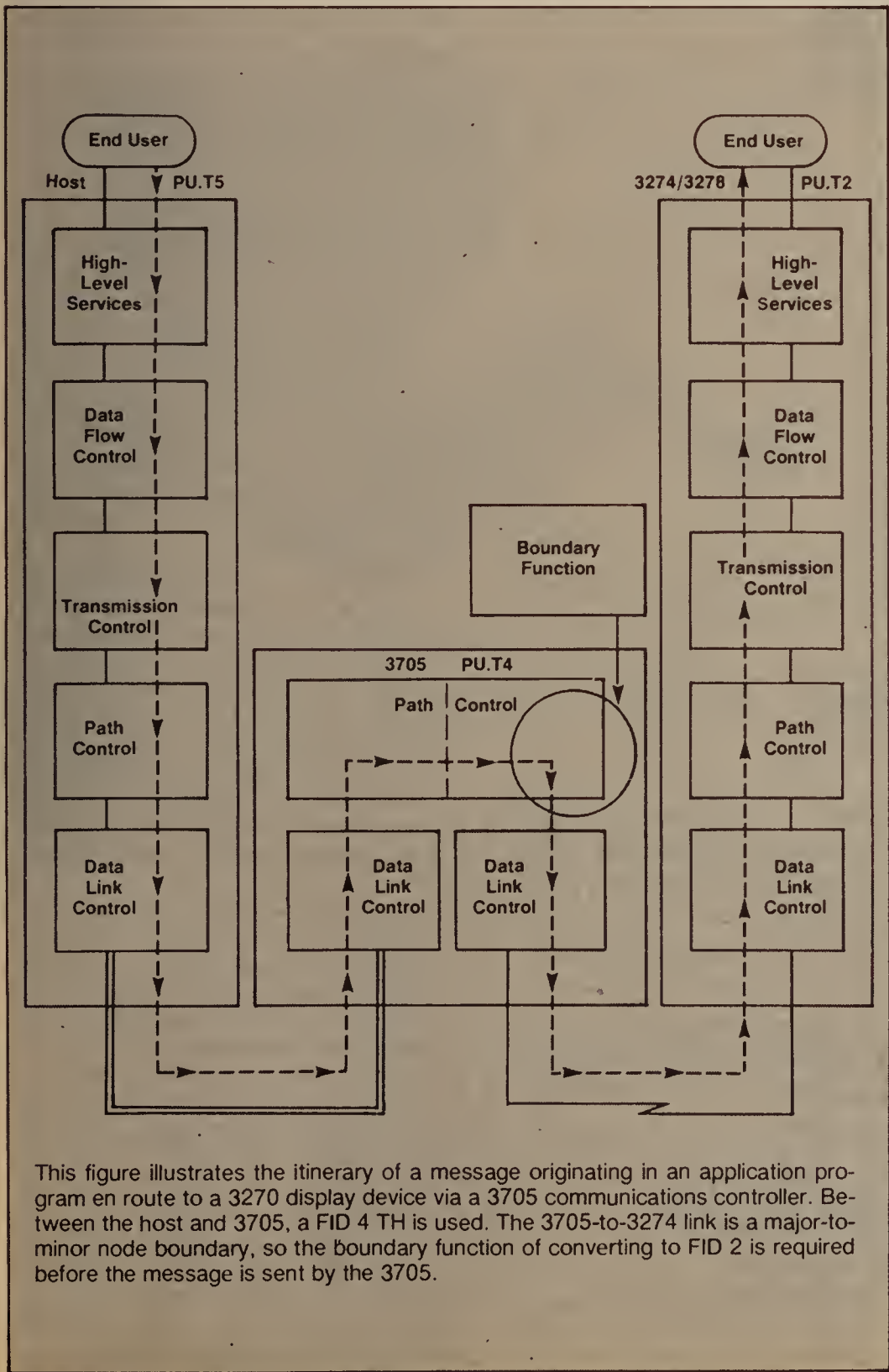


Figure 2-4. Transmission With Intermediate Node

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node. Conversion of FID types and pacing alterations to suit the capabilities of minor nodes are known as boundary functions (again, refer to Figure 2-4). Boundary functions are essentially a process in which the major node provides a simplified interface point into the network for the minor node.

Transmission Control

Transmission Control is the lowest layer of each half-session. For outgoing messages, it constructs the request header that is prefixed to the

request unit. For incoming transmissions, it acts as a "mailman" whose purpose is to deliver the message to the appropriate processing component of the half-session. TC has two other important functions: to keep track of sequence numbers of requests and to synchronize and pace session data.

Half-sessions use sequence numbers to ensure that messages are not lost during transmission. This function is supported using the sequence number field in the transmission header. When a logical unit sends a

message to another LU, a sequence number is inserted in the request header. The sequence is incremented on successive transmissions. The receiving LU checks each incoming message to verify that the sequence number is one greater than the preceding number. The same process occurs for data sent the other way.

Therefore, two sets of sequence numbers are kept by each LU, one for "send" sequencing and the other for "receive" sequencing. When a missing message condition is detected by a secondary LU, it may issue a re-

quest to the primary LU to initiate recovery for the session.

Pacing is a technique used to ensure that RUs are not sent at a rate greater than the receiving node's capacity to handle them. An agreement is made at the time a session is established as to the number of RUs that may be sent before requiring a go-ahead signal for more.

Pacing may be used in one or both directions, although it frequently is only required in the direction of host to minor node. There may be (and typically are) different pacing parameters employed along a single route, with high-capacity pacing employed between major nodes and a more restricted pacing used at boundary nodes.

In addition to a pacing indicator, the three-byte request header built by Transmission Control contains a number of fields used by various elements in the half-session. These include:

- Request/response indicator.
- Bracket and chaining indicators (these topics will be introduced in the next section).
- Information specifying the type of request unit (Data Flow Control, Session Control, Network Control or application data).
- A response indicator specifying whether a definite response, exception response or no response is desired.

Data Flow Control

Data Flow Control concerns itself with protocols relatively close to the conversational level of the end users. Most important, it is responsible for establishing logical groupings of consecutive RUs of a session with two techniques called chaining and bracketing. In addition, Data Flow Control governs the control of send/receive modes, establishes and monitors response protocol and assists in error management.

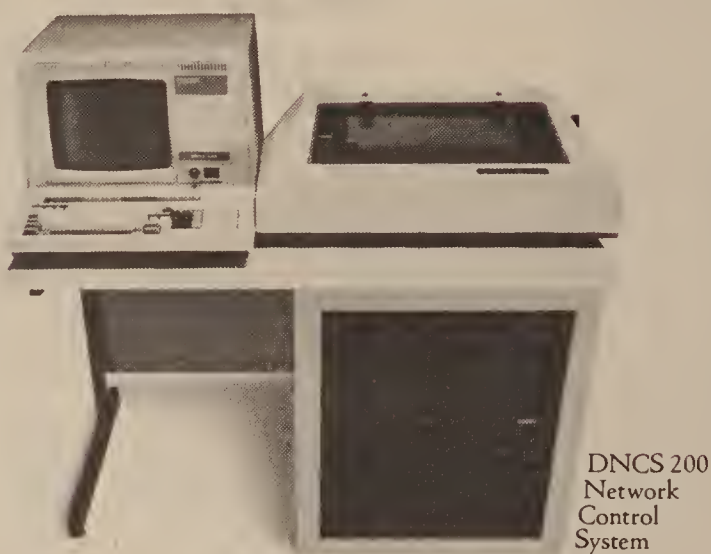
Chaining is a mechanism defined in SNA to delineate recoverable transmission sequences. The easiest way to explain chaining is with an example of a common usage: SDLC frames are usually about 256 bytes long, while a 3270 display screen typically accommodates 1,920 characters. Consecutive RUs may have to be transmitted to a 3278 before a complete screen is ready for presentation.

Once the sender knows the full screen has arrived safely, it may then release its own copy of the data, but does not want to do that until it has confirmation that all the RUs for that screen have been received.

A response to the sender indicating that the last RU of a chain has been received thus acts as a sync-point/commit indicator (in other words, "Message received and sender no longer responsible for it").

Two bits in the transmission header are used to denote that an RU is the first in a chain, in the middle of a chain, last in a chain or the only RU of a chain. In general, exception responses are required for all but the

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last RU in a chain, which requires a definite response.

Finally, chaining can be easily confused with the segmenting function of Path Control, and a single segmented RU might also constitute a chain. But segmenting implies nothing regarding the recoverability of a sequence of RUs; it is a separate and lower level function.

A second technique called bracketing is employed by Data Flow Control to promote integrity at the conversational level. A bidirectional series of RUs flowing between LUs

The highest level of SNA activity is often called the Function Management Layer and incorporates two distinct areas of processing depending upon the type of request unit involved.

and dedicated to a specific activity may be bracketed to prevent intrusion of other RUs unrelated to that activity. Again, an example of a common usage: A TSO session involves

providing TSO processing services to a terminal operator and also allows message routing between operators logged on concurrently. But a message sent to a terminal from another

TSO user will not appear on the screen at any random time. It will only appear after the operator responds to TSO with a transmit key (Enter, a PF key or the like). The reason for this is that brackets are established at the start of a transmission from TSO to the operator and are terminated when his response is received.

Once the brackets are ended, Data Flow Control permits other RUs to be received at the terminal. Brackets protocol is only observed by normal-flow RUs, not by expedited flow. For example, the Enter key or a PF key cannot be used to interrupt a program executing in the TSO foreground, since bracketing is used during this activity. IBM 3270 PA keys result in a signal sent in expedited mode, and consequently they can be used to override the lockout that brackets would normally impose.

Brackets are a rather complicated protocol, the rules for which are agreed upon at session initiation. The agreement may dictate that only one of the LUs may establish brackets or that either LU may. In the latter case, the LU wishing to start brackets must offer a bid to the other LU, requesting permission to do so. If that bid is accepted, the bracketing will commence.

High-Level Services

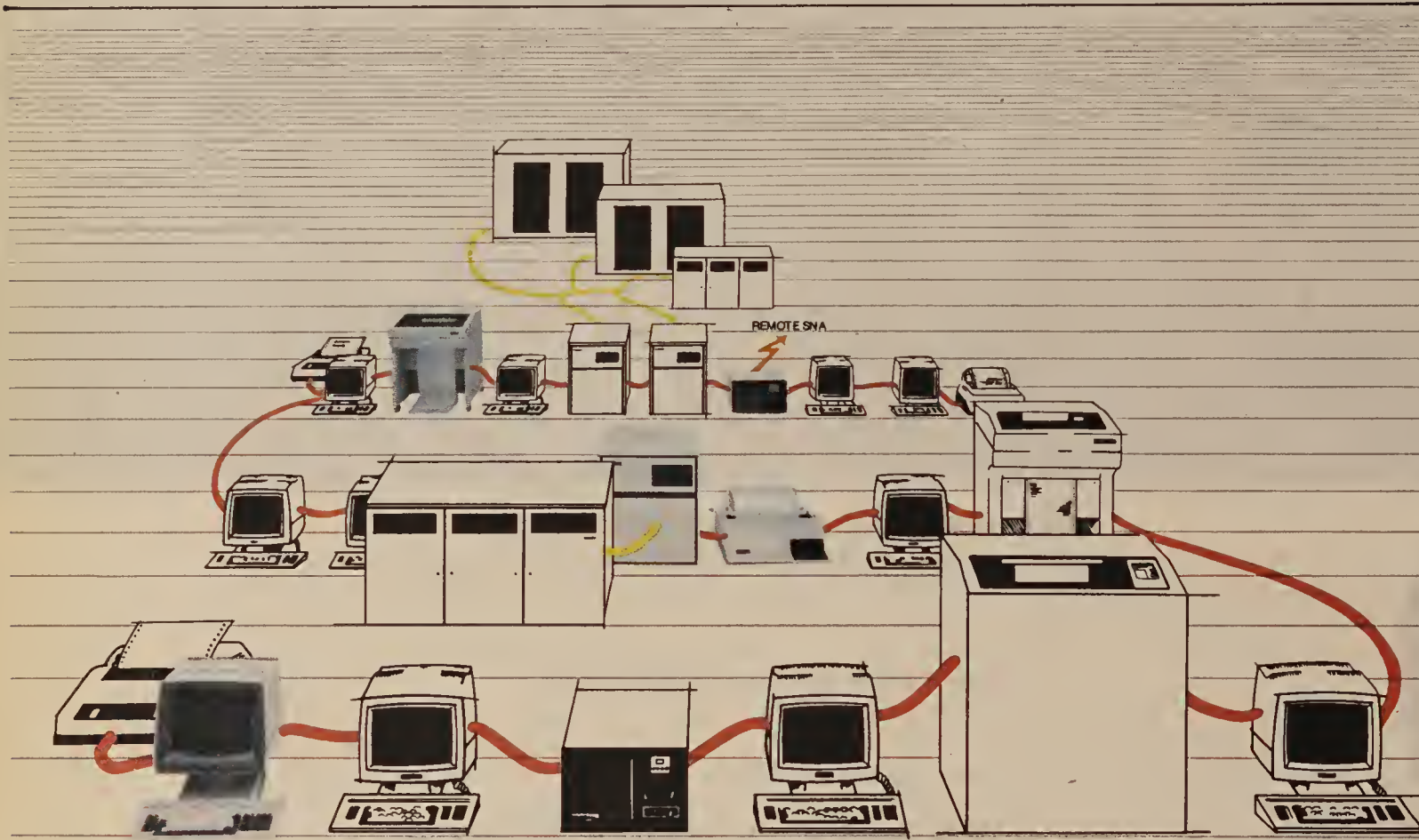
The highest level of SNA activity is often called the Function Management Layer and incorporates two distinct areas of processing depending upon the type of RU involved:

- One category is Network Services, which may be thought of as providing high-level support for an LU-LU session.
- The other category is the general application data transmitted between two LUs in session.

Network Services is comprised of six sets of high-level services, which are responsible for a variety of network management activities:

- Configuration Services communicates network commands to activate links and to load and initialize Network Control Programs (NCPs).
- Maintenance Services performs network maintenance functions, such as activating line traces and uploading NCP storage to a mainframe.
- Management Services basically acts as a long-distance carrier for other classes of network services.
- Session Services is generally involved in cross-domain session requests and control activities.
- Measurement Services participates in information gathering for network analysis purposes.
- Network Operator Services is the portal through which information flows to and from the network operator.

The second broad category of high-level processing is that involved with the actual application data flowing between two LUs, and within this category are two classes of RUs: those containing only data and those containing a prefix in the



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RU called a function management header (FMH).

RUs with no FMH consist either of display data and information for display formatting or simply contiguous bytes of data meaningful to the receiving LU. A high-level function called Presentation Services deals with the specifications for formatting, mapping the data between transmission format and the indicated physical layout. The most familiar example of Presentation Services is that which converts the 3270 data stream to the external representation

viewed on the screen. Basic Mapping Support (BMS) of CICS is another implementation of Presentation Services.

Request units with function management headers are a rather more complicated topic, but they can briefly be explained with several examples of common usage.

- Model 3777 RJE stations exist as single LUs, but they contain multiple physical devices (such as printers or card readers). In sessions involving 3777s, FMHs are used for device selection and management.

- Data streams likely to contain frequent occurrences of repeating characters (such as spaces in printer output) may be compressed to reduce transmission time; FMHs provide this compression information.

- Distributed presentation management is a technique whereby display formats and all literal data are downloaded to an intelligent receiving (displaying) station. FMHs are used in this case to identify to that station the particular transform to be used.

- Any application-to-application

communication may use "home-grown" FMHs for whatever purposes are appropriate. Use of FMHs implies some computational abilities in both partners of a session; they are specifically not permitted in 3270-type transmissions.

Sessions Revisited

At this point, it should be apparent that there is a substantial variety of options at the disposal of SNA product designers and that the number of permutations on all possible combinations of those options can be intimidating. In reality, however, there are certain practical combinations of particular allowable options that can be reused in many different situations by an LU type. These combinations, known as session profiles, are of two types:

- Transmission Services (TS) profiles deal primarily with options available at the Transmission Control level. They dictate such things as the use of pacing and sequence numbers, the maximum RU size allowed and what TC-level SNA commands are permitted.

- Function Management (FM) profiles dictate options available to the two upper SNA layers. They control the use of FM headers, bracketing, multiple-RU chaining and data compression. They also define such things as response types required (definite or exception), which half-session is responsible for recovery and which DFC-level SNA commands may be issued.

There are currently some seven TS profiles and nine FM profiles built into SNA, and each is appropriate to only certain LU types. In general, the difference between the various profiles of either type is in the level of sophistication of SNA support they offer.

Multiple-Processor Networks

The early SNA networks were restricted to a single host processor and thus a single system services control point (SSCP). Today, of course, there are vast possibilities for configuring multiple processors in a network, including processors offered by non-IBM vendors, most of whom provide at least some level of SNA support. A processor can exist in an SNA network in one of two forms:

- As a fully independent host running Vtvm. In this case, the host is an SSCP and can be said to be a major node of PU.T5.

- As a processor executing some type of emulation program that allows it to appear as a minor node to the network.

In the latter option, the CPU is often referred to as a subhost. Many minicomputers are incorporated into SNA networks this way. In a typical configuration of this type, the subhost will have locally attached terminals that can converse with applications running in the subhost. One of those applications will provide an interface or gateway into the network by allowing the local devices of the subhost to appear as standard SNA

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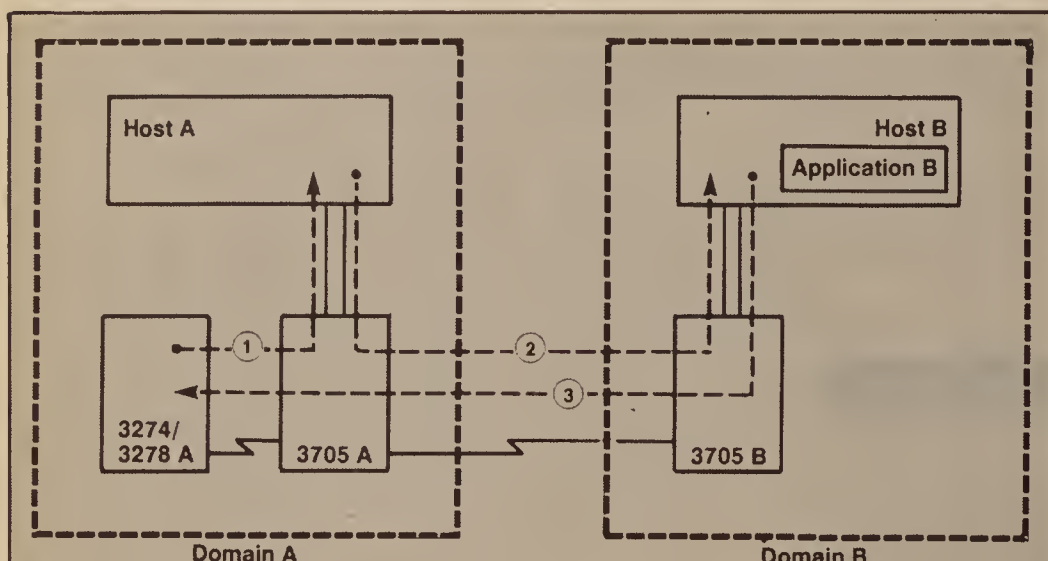
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 SSCP-PU: Host A & 3705 A
 Host A & 3274 A
 Host B & 3705 B
 SSCP-LU: Host A & 3278 A
 Host B & Application B

The process of Terminal A logging on to Application B proceeds as follows:

1. Terminal A sends the applications identifier to its own SSCP, which determines that the requested resource is in another domain.
2. SSCP in Host A contacts SSCP in Host B, informing it of the request for Application B. If Application B finds Terminal A acceptable, then:
3. A direct LU-LU session is established. Session data flow is directed along the indicated path for the duration of the session. Thus, Terminal A is temporarily owned by Host B for the session's duration.

Figure 2-5. Establishing a Cross-Domain LU-LU Session

devices to the network.

These gateway interfaces are frequently referred to as pass-through programs. Their most common uses are as cluster controller emulators and as remote JES workstation emulators. This is the way the majority of non-IBM minicomputer manufacturers provide SNA compatibility with their systems. IBM minicomputers like the System/34s, 38s, 8100s and 4300s running under VM are also often tied into the network in this manner.

Multiple full hosts present a more complicated situation, because multiple independent system services control points exist.

Host-to-host communications is accomplished under control of the Multiple System Network Facility (MSNF) by a type of session not previously mentioned: the SSCP-SSCP session. Like SSCP-PU and SSCP-LU sessions, they are automatically established at network start-up or may be explicitly established by command of the network operator.

SSCP-SSCP sessions provide the foundation upon which cross-domain LU-LU sessions can be established; these LU-LU sessions may be of any type allowed in a single-domain network, including application-application communications.

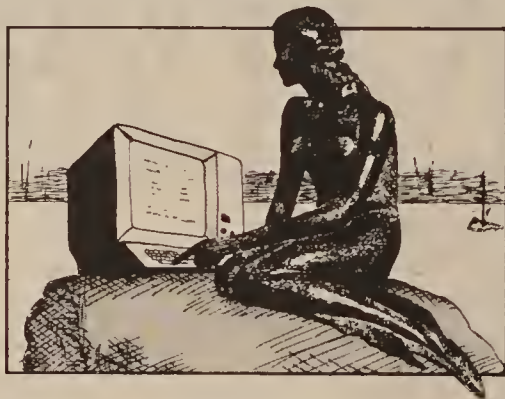
The process of establishing a cross-domain LU-LU session is illustrated in Figure 2-5, in which a terminal logs on to an application in a remote domain. To begin with, all nodes in a network are owned by a single SSCP. Any LU attempting to communicate with a remote LU first contacts its own SSCP. That SSCP will then determine that the resource requested (in the illustrated example, an application) resides on a remote system.

The SSCP-SSCP session is then used as the vehicle to initiate the cross-domain LU-LU session. The SSCP that owns the terminal may effectively withdraw from the proceedings once the LU-LU session is active, and the terminal becomes temporarily owned by the remote SSCP for the duration of the session. This situation is possible because path control can direct transmissions along a virtual route, which does not have to include the terminal's owner SSCP.

An anticipated facility of Vtam/MSNF is one that will assist in the process of merging existing, previously independent networks (as might be required when corporations merge). Rather than renaming all network addressable units (NAUs) to have unique network

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IN DEPTH

addresses across all domains, MSNF can be instructed to apply an address translation function of domain-to-domain boundaries. In this way, disruption within any of the domains subject to integration is minimized.

Finally in this discussion of multiple-host networks, there is one particular configuration of hosts that is important but potentially confusing. The low-end 4300 series processors are available with SDLC ports which permit them to establish direct communications with remote communications controllers without the expensive requirement for a local channel-connected communications controller. These processors may be fully independent SSCPs (PU.T5s), but also must support certain communications controller (PU.T4) activities.

This requirement is met with an extended version of Vtam called Vtam/E, which runs under DOS/VSE and performs some NCP types of processing. So, in a sense, Vtam/E turns its host 4300 into a hybrid PU.T5 and PU.T4. As small 370-compatible processors like the 4300 series grow less expensive, this configuration is likely to become increasingly commonplace.

A Look Forward

While it is usually not wise to try predicting future evolution of IBM's products, several areas related to SNA particularly invite speculation.

The first is the future role of the VM operating system within SNA networks. Currently VM's only compatibility with SNA is the provision of 3270 pass-through software of the type mentioned earlier. The alleged history of VM, sometimes referred to as the "black sheep" of the IBM operating system family, is that it was initially intended for internal use by IBM only and that its emergence as a software product was somewhat accidental.

Yet the growing popularity of VM is at odds with its incompatibility with SNA. Because of this situation, IBM has indicated that we will eventually see an SNA-compatible VM, that IBM will release a Vtam (or equivalent) that runs directly under VM.

A second area of future SNA development is much broader in its implications; that is, the role of personal computers in networks. At this point, hardware and

software vendors alike are scrambling to provide the suddenly desirable micro-to-mainframe connection.

Yet the very flexibility of these devices produces an immediate enigma when one attempts to define their proper place within the pos-

sibilities offered by SNA. At times, personal computers need to behave as 3270 terminals (LU.T2), at other times as data transferral units (LU.T1) and at still other times as applications communicating with a mainframe (LU.T6 or LU.T0).

This dilemma would be solved by the availability of a universal LU type upon which all LU-LU sessions would be based, regardless of the nature of the end users of those sessions. With microcircuitry continuing to become less expensive, more

sophisticated protocol processing in all devices is now an economical option, and a single standard LU on which to base all future products could be advantageous in any case.

The widespread use of personal computers within



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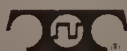
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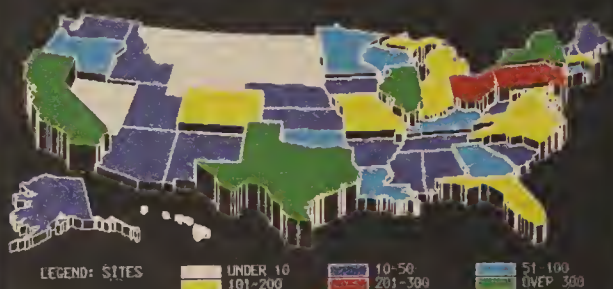
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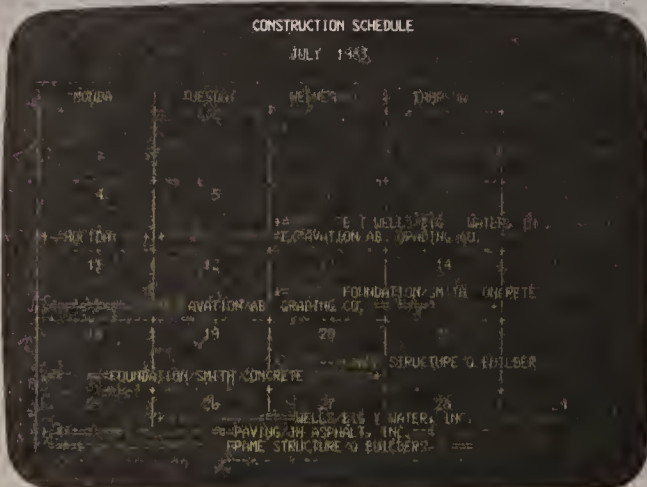
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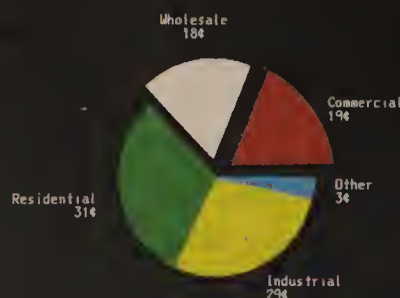
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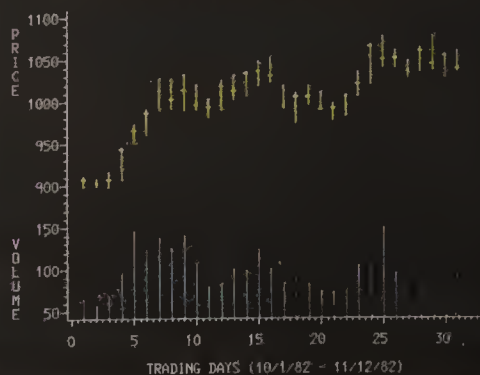


SOURCE: Carolina Power & Light 1981 Annual Report, p. 6

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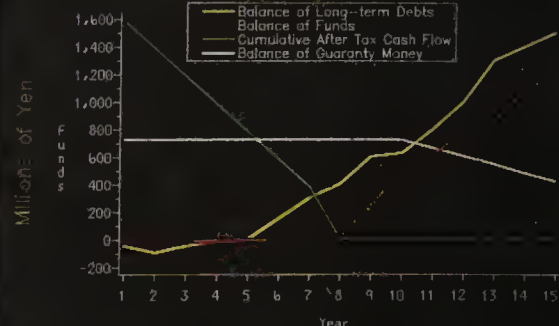


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Kajima Corporation 1980 Annual Report



SOURCE: Kajima Corporate Overview, p.

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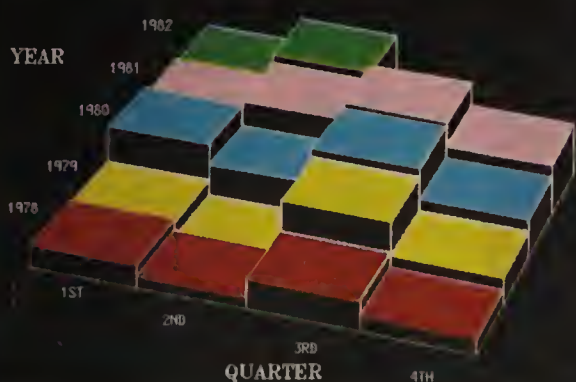
	JAN 7	FEB 7	MAR 7
PROPOSED SALE	11,000	11,000	11,000
LESS: RETURN AND DISCOUNT	(1,000)	(1,000)	(1,000)
NET SALE	10,000	10,000	10,000
TOTAL COST OF SALE	(8,000)	(8,000)	(8,000)
GROSS PROFIT	2,000	2,000	2,000
OPERATING EXPENSE	(2,000)	(2,000)	(2,000)
OPERATING INCOME	0	0	0
OTHER INCOME EXPENSE	0	0	0
TAXABLE INCOME	0	0	0
INCOME TAXES	0	0	0
NET INCOME	0	0	0

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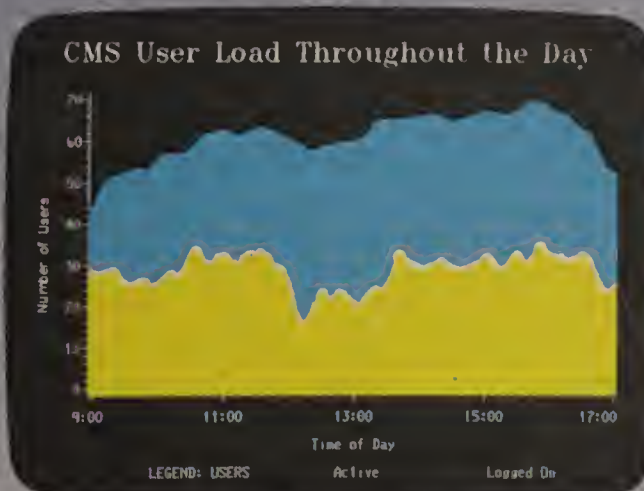
Command ==> _ DEF MODE

Units Sold (all products combined)					
USA	50	250	100	400	50.00
Europe	10	50	20	80	10.00
Asia	40	200	80	320	40.00
Total Units	100	500	200	800	100.00

Sales (all products combined)					
USA	655	250	1310	2215	51.05
Europe	101	35	202	338	7.91
Asia	540	160	1079	1719	40.24
Total Sales	\$1,296	\$395	\$2,591	\$4,272	100.00

Operating Costs					
USA	225	1125	450	1800	72.73
Europe	35	80	70	185	7.47
Asia	160	10	320	490	19.80
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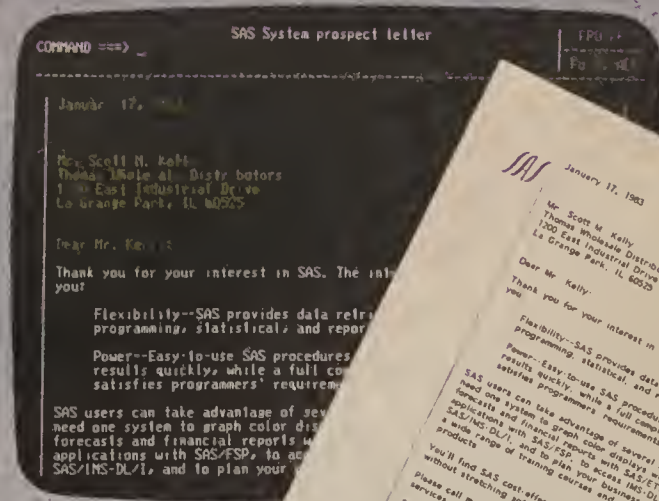
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IN DEPTH

corporate networks is a situation most experts believe is inevitable, and IBM has traditionally regarded great flexibility in its products as a necessary quality.

Perhaps the combination of these two factors will hasten the birth of the universal

LU type.

With IBM's acquisition of significant portions of Satellite Business Systems and, more recently, of the Rolm Corp., there is no doubt of its commitment to become a major contender in the communications technologies arena.

In the next several years, we may likely witness the greatest corporate showdown of all times, the "King Kong vs. Godzilla" of high tech.

Data processing and data communications have become inextricable, and as the communications giant AT&T

gains the freedom to pursue business in data processing, we can probably expect to see counter-strategies from IBM that will necessitate increased capabilities for SNA. Just what these increased capabilities will be is anybody's guess, so stay tuned

for the latest developments.

A Look Back

In the early years of SNA, there was a great deal of confusion throughout the data processing community as to not only what it was, but why it was. IBM's detractors criticized it as an act of arrogance that ignored efforts in progress to define a truly standard communications architecture. Critics contended that SNA was blatantly intended to stifle legitimate competition. IBM supporters countered that SNA was not a product of arrogance at all, but one of necessity; an architecture was needed quickly, not at some unspecified future time.

There are, no doubt, some elements of truth in both views. SNA has certainly become one of the major standards of communications architectures, and only a company with IBM's pre-dominance in the marketplace could have achieved such a feat.

For several years, SNA did effectively lock out competition from other vendors of communications equipment as they strove to understand the new architectural requirements imposed, but that was a temporary situation. The fact that all the other major computer manufacturers have yet to settle on a universal standard architecture is certainly justification that IBM could not wait for an industrywide consensus to emerge on which to base its own future technologies.

There is one other simple and potent fact, however, that justifies the existence of SNA, if such justification is really needed. It is efficient, flexible and reliable. In short, SNA works.

About the Authors

David Baer has been active in DP for 15 years, specializing the last few years in architectural design of large-scale, on-line applications. He is now technical director of IBM mainframe application development for Tera Corp., a Berkeley, Calif., firm that provides proprietary software and hardware to utilities and general industrial clients.

Jim Sturch is an independent consultant and instructor in various areas of data processing. He has 10 years' experience in operating systems and telecommunications. He currently specializes in the areas of MVS and SNA and teaches an SNA course under the auspices of the Mariposa Corp. of Larkspur, Calif.

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Justifying Subsecond Response Time

By Harold Lundy

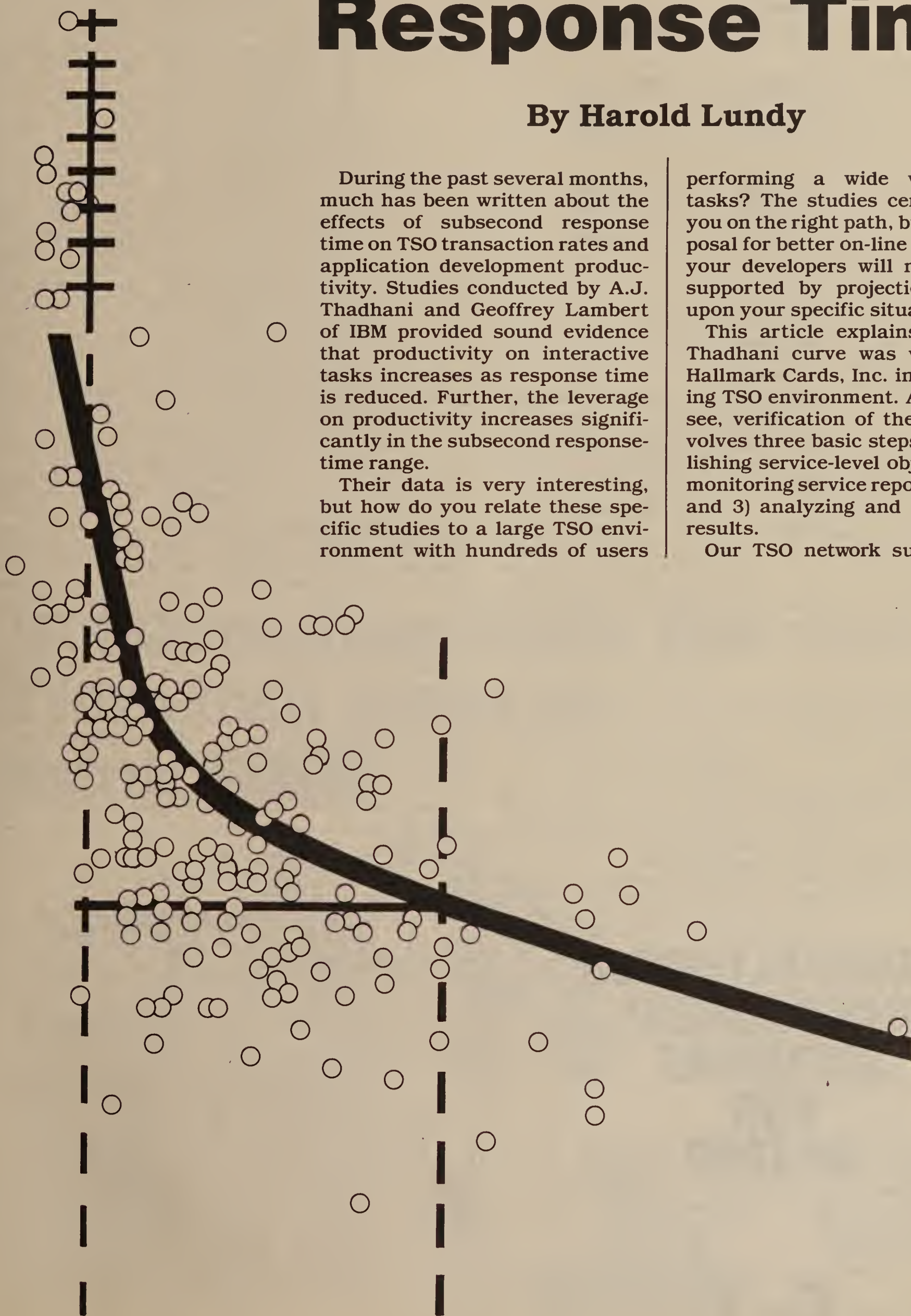
During the past several months, much has been written about the effects of subsecond response time on TSO transaction rates and application development productivity. Studies conducted by A.J. Thadhani and Geoffrey Lambert of IBM provided sound evidence that productivity on interactive tasks increases as response time is reduced. Further, the leverage on productivity increases significantly in the subsecond response-time range.

Their data is very interesting, but how do you relate these specific studies to a large TSO environment with hundreds of users

performing a wide variety of tasks? The studies certainly set you on the right path, but any proposal for better on-line service for your developers will need to be supported by projections based upon your specific situation.

This article explains how the Thadhani curve was verified at Hallmark Cards, Inc. in our existing TSO environment. As you will see, verification of the curve involves three basic steps: 1) establishing service-level objectives, 2) monitoring service reporting tools and 3) analyzing and comparing results.

Our TSO network supports an



IN DEPTH

Performance Objectives (reported)		
Service Area	Service Objective	Measurement Method
TSO		
Average ----- Response Time -----		
Trivial	.5 seconds	TSOMON
Nontrivial	5 seconds	TSOMON
Long	30 seconds	TSOMON
90%		
Trivial	2 seconds	TSOMON
Nontrivial	20 seconds	TSOMON
Long	60 seconds	TSOMON
Availability	97%	TSOMON
Batch		
90% ----- Input Queue Time -----		
Class G and L (high priority)	20 minutes	SMF
Class A (medium priority)	30 minutes	SMF
Class 9 (normal priority)	60 minutes	SMF

Figure 1

average of 450 active users, of which 200 are systems development staff using locally attached terminals. The network runs on an IBM 3081K, which is shared with batch testing during prime shift hours. The system is equipped with an Intel Corp. 3805 high-speed paging device used for TSO paging. Maximum sign-ons for TSO is currently set at 145 simultaneous users. An IBM 3033 AP handles both production and batch processing.

The systems development staff function includes work in all phases of project development, support of more than five million production lines of code and information center programming support.

Daily TSO activity includes writing memos and documents (word processing), editing and browsing of data, library scans, on-line program compile and debug, submission of batch jobs and use of various TSO-developed project management tools.

Volume on the network averages

200,000 to 225,000 transactions per day, with an average of 6½ to seven transactions processed per second.

Service-Level Objectives

Service-level objectives for the systems development staff had been discussed for some time. During late 1982, the objectives being used today were established and agreed to by data processing management. The objectives that resulted were influenced by three factors:

1. Service that was currently being provided.
2. A realistic view of what the computer resource could provide.
3. An optimistic view of the productivity gains that could be realized with better on-line service.

In other words, current service was reviewed and service-level objectives were set at a level that appeared realistic for the hardware resource available.

The objectives were set individually for each of three transaction

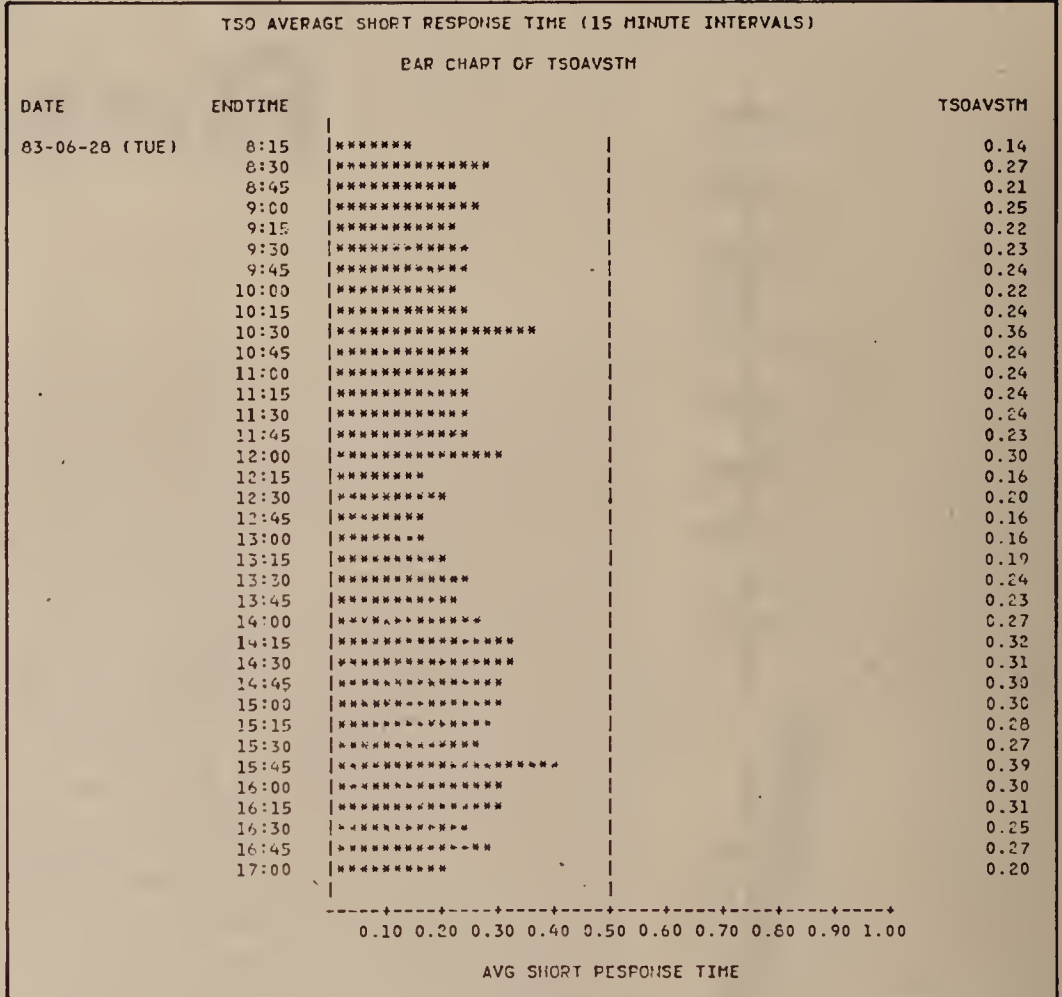


Figure 2

priority categories: trivial, nontrivial and long. The definition of these categories can be set arbitrarily by each installation. Ours are defined as follows:

- Trivial — 500 or less service units (high priority).
- Nontrivial — 501 to 2,000 service units (medium priority).
- Long — 2,001 or more service units (low priority).

The appropriate setting of the service unit threshold values that distinguish these three priority categories can be important to optimum service, as you will see later.

Average response time objectives

were established as .5 seconds for trivial, five seconds for nontrivial and 30 seconds for long transactions.

Ninety percent of all transactions in each category need to be completed in two, 20 and 60 seconds, respectively. Service objectives were also set for the various job classes of batch testing. Since TSO and batch share the same system, an appropriate balance of service for each must be maintained. (See Figure 1 for a complete list of service objectives.)

Service Reporting

Only weekly and monthly reporting were available, but it quickly

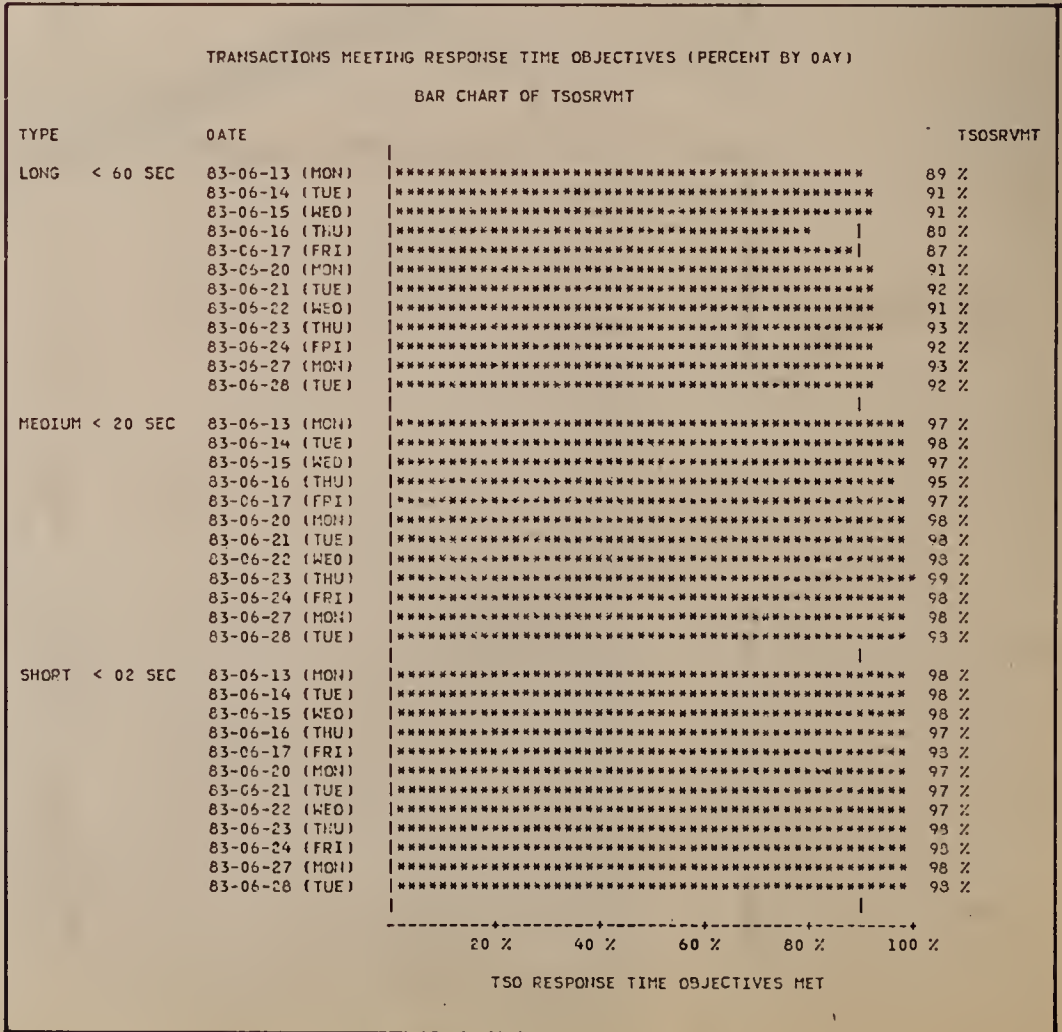


Figure 3

MANUFACTURING MANAGEMENT SOFTWARE FOR HP3000

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became apparent that daily service reporting was essential for identifying and reacting to problems on a timely basis. This need resulted in the development and installation of several daily reports that are used to monitor response time, transaction load and resource consumption on the TSO network. Figure 2 shows a report used to monitor short transaction average response time for each 15-minute interval during the prime shift hours. Figure 3 is a report that measures the percent of transactions meeting the response time objectives each day.

Other reports show the average system users, transaction load, service unit consumption and system uptime by five-minute time period, with appropriate summaries for the day. These reports identify problem areas immediately and are used by our technical staff to maintain optimum service and the desired balance between TSO and batch work.

Our experiences during the first week of May dem-

onstrate how the reports can be used. As mentioned earlier, the service-unit thresholds for transaction-priority categories can be set arbitrarily; ours was 500 for trivial (highest priority). This category encompassed 85% of our total transaction activity, while in Thadhani's study, 95% of the transactions were in the highest priority category.

On May 2, we decided to move the threshold to 600 service units to encompass more activity and move toward the 95% figure. The ensuing week showed a significant drop in batch test service; thus, it became apparent that the 95% level for the trivial category in our environment would cause excessive batch turnaround time. The threshold was returned to 500 on May 9. Figure 4 shows batch service results before, during and after this experiment.

Data for the reports is provided by the software package TSOMON, marketed by Morino Associates, which samples and records the TSO

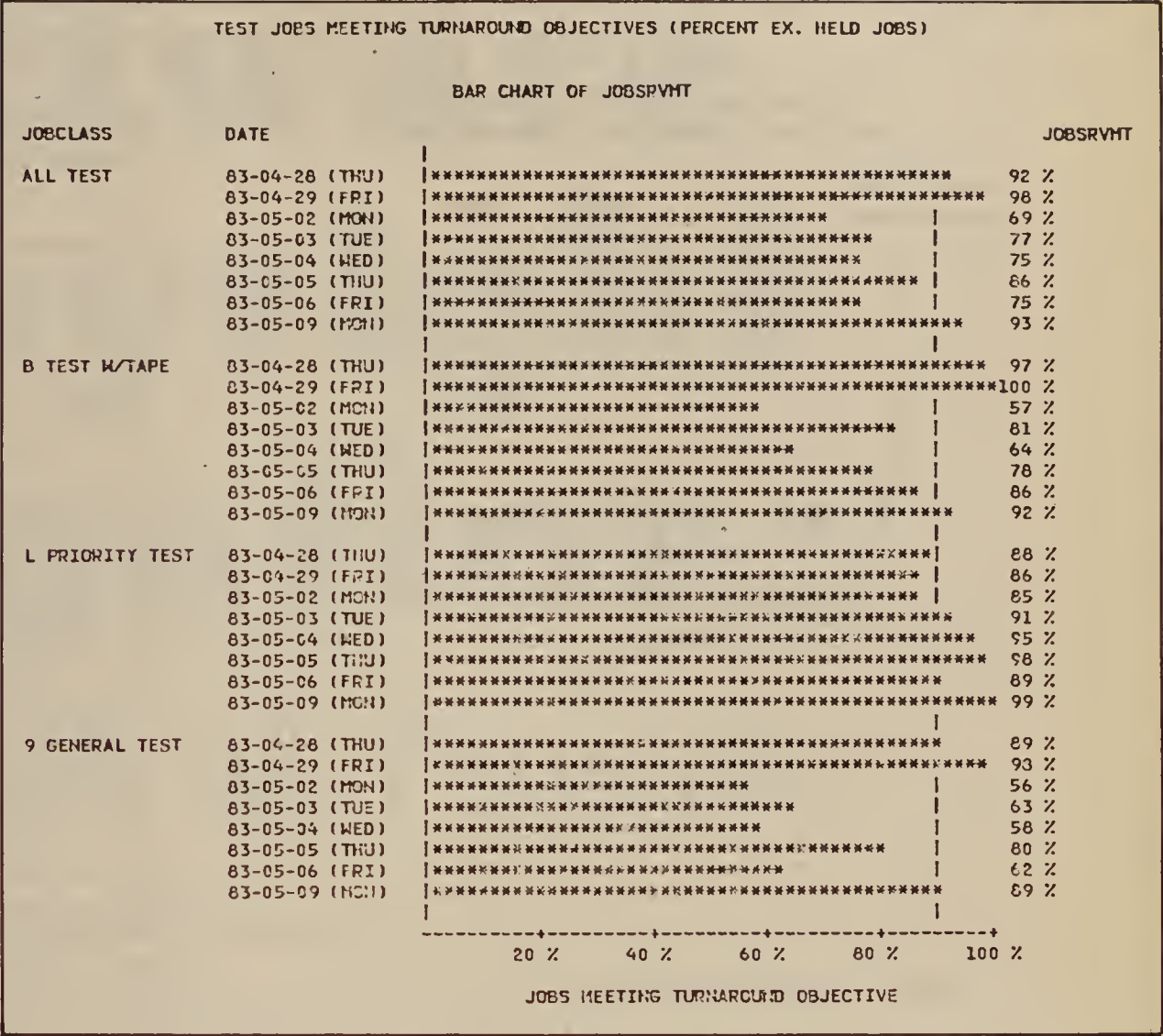
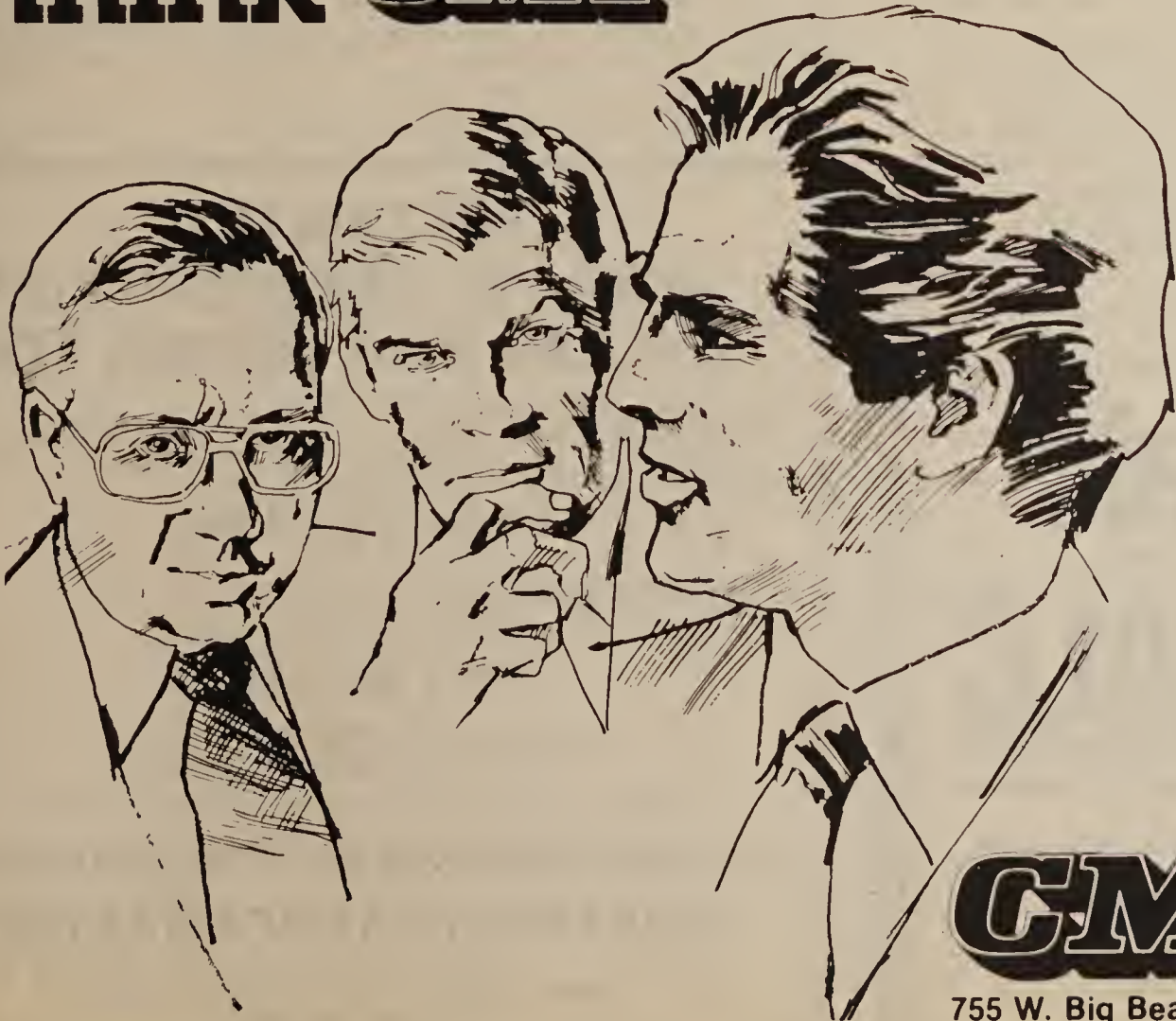


Figure 4

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IN DEPTH

Comparison of Actual Response Times
And Transaction Rates to Thadhani Curve

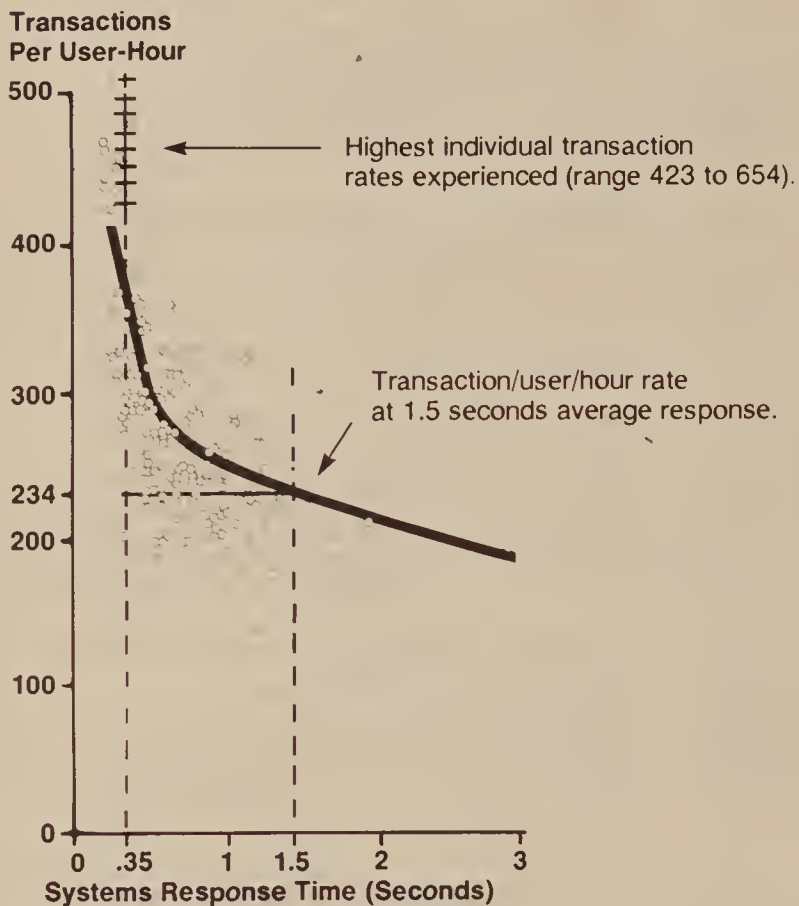


Figure 5

performance data. While it would not provide accurate data for a remote environment since it does not measure network delay time, it works well for us because all TSO users are on locally attached terminals. To confirm its accuracy for us, a terminal response time monitor was attached to individual CRTs for several weeks.

The indication was that network delay was negligible.

During the first six months of 1983, the reports have shown an average of 1.5 seconds response time for all TSO transactions and .35 seconds for trivial transactions (85% of total TSO activity). The 90th-percentile objective (two seconds) has been consistently met with few exceptions. Although not as consistent, nontrivial has averaged in the four-

to five-second range, with long transactions averaging about 25 seconds.

With the IBM studies fresh in mind and subsecond response time being achieved on a significant percentage of the TSO activity, the next step was to calculate transaction rates and see if the Thadhani curve could be verified in our environment. The necessary data was available and only needed to be analyzed.

Comparison Results

The analysis was performed using individual transaction rates for calendar-month periods using the same calculation recommended in the studies: $\text{TRANSACTIONS} \div \text{USER HOURS} = \text{TRANSACTIONS/USER/HOUR}$.

The results were very surprising.

The diverse TSO usage in a large-shop environment makes it unrealistic to expect subsecond response time for all transactions, but when provided for 85% or more of TSO activity (trivial transactions), productivity will increase dramatically.

Many analysts were achieving transaction rates over the length of a month of 400 to 650 per signed-on hour, well toward the top of the Thadhani curve. For the month of March, the average TSO transaction response time for all transactions (trivial, nontrivial and long) was 1½ seconds, with a calculated average of 234 transactions per user per hour, precisely the yield that the Thadhani curve indicates.

While the TSO activities of all TSO users are too diverse to expect the overall transaction rate to be at the top of the curve, the people performing a very high percentage of trivial transactions are definitely achieving the transaction rates indicated by Thadhani and Lambert's studies at the high end of the curve. Figure 5 illustrates the close correlation, with our points plotted at .35 and 1.5 seconds for trivial and total transactions.

Obvious questions arise at this point. Will transaction rates continue to climb at this rate as response time approaches zero? Are we, at .35 seconds response, approaching a human threshold for system development activity? Faster equipment and further research should provide the answers to these questions.

Conclusions

At the risk of sounding like a hardware vendor, the conclusions we draw from our analysis are:

- The Thadhani curve is realistic;

transaction rates do increase dramatically in the subsecond response-time range. Furthermore, the curve can be verified in any TSO environment.

- The diverse TSO usage in a large-shop environment makes it unrealistic to expect subsecond response time for all transactions, but when provided for 85% or more of TSO activity (trivial transactions), productivity will increase dramatically.

- Service-level objectives and daily monitoring tools are essential in justifying and maintaining subsecond on-line development service on a day-to-day basis.

- Projections of productivity potential using the Thadhani curve are valid and should be used in justifying the cost of better service for a development staff.

- TSO should be given higher priority than batch work to maintain consistent service. However, if staff productivity is dependent on both, the correct balance must be found and maintained.

So, set the objectives, dig out the numbers, project with the curve and you are on the way to better on-line service and increased productivity.

About the Author

Harold Lundy is applications manager, systems development, at Hallmark Cards, Inc. in Kansas City, Mo. He has worked for Hallmark for 22 years in the system operations and systems development areas.

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Software Copyright Litigation:

After Apple vs. Franklin

By Neil Boorstyn

The recent decision of the Third Circuit Court of Appeals in the case of Apple Computer, Inc. vs. Franklin Computer Corp. should bring to an end what may be called the first generation of copyright litigation involving computer software. The main focus of the first wave of cases concerned the copyrightability of computer programs — that is, whether the programs constituted fixed original works of authorship and were eligible for protection under copyright law.

Now that the arguments against copyright protection have been rejected by virtually every court that has dealt with the question, it is anticipated that the next wave or second generation of software copyright litigation will deal with fundamental and real copyright issues relating to scope of protection, copyright infringement and idea/expression dichotomy, the question of substantial similarity, the defense of fair use and other traditional issues.

The courts thus far have had little opportunity to deal at length and in depth with these issues. To date, the reported cases

have arisen in connection with motions for preliminary injunctions, for summary judgment or to dismiss. Rejecting the arguments urged in the reported cases has been comparatively easy for the courts because the arguments have been so lacking in merit, so contrary to the language of the Copyright Act and without support in the statutory scheme, the congressional intent or case law.

This article summarizes the early decisions and the near-total rejection of the array of defenses that have been interposed and will look at the more substantive issues and defenses that must now be litigated. Some of the decisions discussed relate to audiovisual works in the form of video games. However, the law relating to the protectability of such works is, in most instances, the same as the law relating to computer programs.

In one of the earlier cases involving electronic video games, Stern Electronics, Inc. vs. Kaufman, 523 F Supp 635 (1981, ED NY), aff'd F2d 852 (1982, CA 2), defendant contended that the audiovisual display

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was not an original work of authorship because the unregistered underlying computer program dictated and controlled the sights and sounds of the audiovisual display. The audiovisual material, according to defendant, was not original because it was totally dependent upon the memory device and the unregistered program.

Although the audiovisual display emanated from the program, the district court ruled that it was "senseless" to say that therefore the display was not original. "An author's work does not become any less original after he has found a means to replicate it."

The court stated that both the underlying computer program and the audiovisual display are copyrightable. The Second Circuit affirmed and termed "without merit" defense contentions that the audiovisual work was neither "fixed" nor "original." The audiovisual work was permanently embodied in a material object (the memory devices) from which it could be perceived with the aid of the other components of the game. All portions of the program, once stored in memory devices anywhere in the game, are "fixed" in the tangible medium within the meaning of the Copyright Act. The displayed sights and sounds resulting from the program embodied in memory devices satisfy the requirements of originality.

In *Tandy Corp. vs. Personal Micro Computers, Inc.*, 524 F Supp 171 (1981, ND Cal), the court held that there "can be little doubt" computer programs are copyrightable works of authorship that may be "fixed" in "any tangible medium of expression, now known or later developed," from which the work can be "perceived, reproduced or otherwise communicated, either directly or with the aid of a machine or device." Moreover, it "makes no difference what the form, manner or medium of expression may be" — whether it is in words, numbers, sounds, pictures or any other symbolic indicia, whether embodied in a physical object in written, photographic, magnetic or other stable form, and whether it is capable of perception directly or by means of any machine or device "now known or later developed."

Thus, the imprinting of a computer program on a sili-

con chip, which then allows the computer to read the program and act upon its instructions, clearly gives rise to copyright protection. The court rejected defendant's argument that the read-only memory (ROM) chips are not "copies" of the original com-

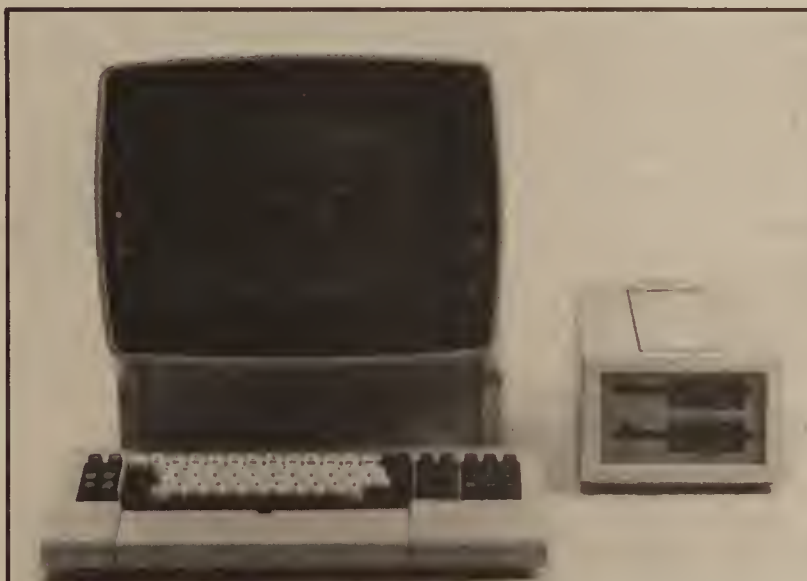
puter program and that, therefore, copying the chip does not infringe the copyright in the program.

The Third Circuit Court of Appeals in the case of *Williams Electronics, Inc. vs. Artic International, Inc.*, 685 F2d 870 (1982, CA 3) rejected

arguments that the images in audiovisual games are transient and cannot be "fixed" and that the player's participation withdraws the game's audiovisual work from copyright eligibility because there is no set or fixed performance and the player be-

comes a coauthor of what appears on the screen. It also rejected the contention that there can be no copyright protection for ROM chips (in which the program is fixed) because they are utilitarian objects or machine parts. (The opinion in the *Williams*

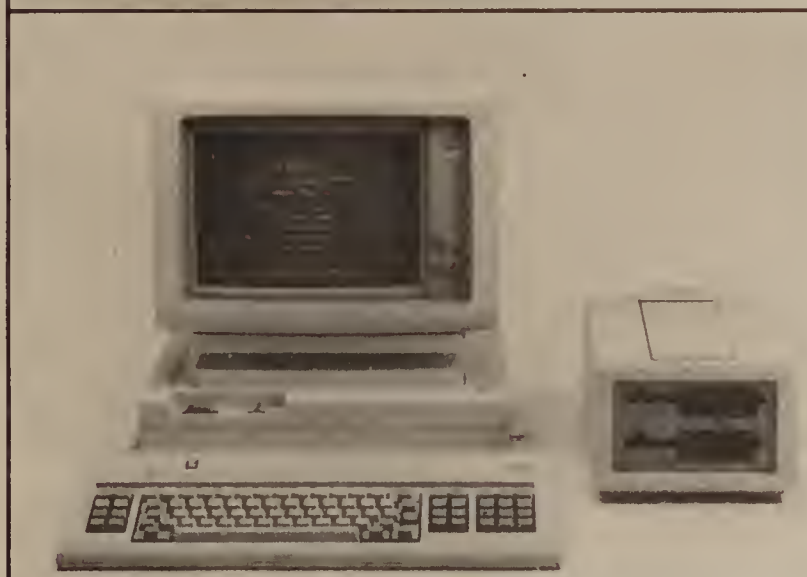
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case was written by Judge Sloviter, who also wrote the opinion in *Apple vs. Franklin*.)

The court held that the fixation requirement is met whenever the work is sufficiently permanent or stable to permit it to be reproduced or otherwise communicated for more than a transitory period, that the repetitive sequence of a substantial part of the sights and sounds of the game are copyrightable and that the utilitarian object machine part argument is "misdirected."

The issue is not whether plaintiff could protect the ROM itself, but rather whether plaintiff could protect "its artistic expression in original works which have met the statutory fixation requirement through their embodiment in the ROM devices." Also rejected was the contention that a ROM is not a "copy" of the program and a copyrighted program is not infringed when the program is loaded into electronic memory devices (ROMs) and used to control the activity of machines. The argument that a "copy" must be intelligible to human beings and must be intended as a medium of communication to humans was rejected.

Finally, the court refused to accept the argument that infringement of a computer program is limited to copying of the program text but not to copying the program fixed in a ROM chip.

In other cases, defense contentions relating to alleged technical irregularities or failures to comply with statutory deposit requirements have been unavailing. (See, for example, *Williams Electronics, Inc. vs. Artic International, Inc.* supra.)

Attempts by defendants to invalidate copyrights due to omission of copyright notice have also been unsuccessful. For example, in *Midway Manufacturing Co. vs. Dirkschneider*, 214 USPQ 417 (1981, D Neb), defendant contended that the failure to place copyright notices on the video games' printed circuit boards invalidated plaintiff's copyright. The court explained that under the Copyright Act, notice may be placed on copies in such place and manner as to give reasonable notice of the claim of copyright. Therefore, plaintiff satisfied the notice requirements by affixing copyright notice to the video game cabinets near the viewing screen.

Perhaps the most bizarre

and unrealistic defense to date appears in the case of *Midway Manufacturing Co. vs. Bandai-America, Inc.*, 546 F Supp 125 (1982, DC NJ). Defendant produced evidence in the form of deposition testimony of the Copyright Office examiner who

processed plaintiff's copyright registration applications to the effect that the applications were "not substantively examined to verify the originality" of plaintiff's works. In light of such "failure," the defense contended that the registra-

tion certificates could not form the basis of a *prima facie* showing of originality and that such "failure" should invalidate the copyrights. The court wasted no time with that argument and stated that it "skirts the borders of bad faith." So much for

nonsense defenses.

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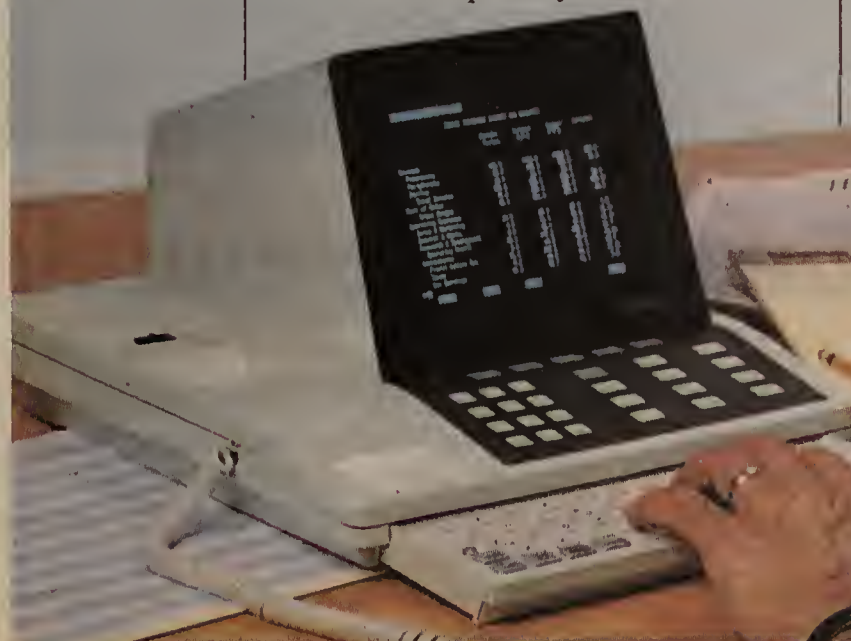
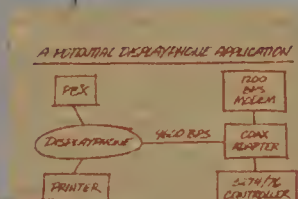
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copyright purposes, neither the Copyright Act nor case law makes any such distinction. Although it is not entirely clear what the confusion is all about, it may arise, at least in part, from the baffling opinion of the district court in *Apple Computer, Inc. vs. Franklin Computer Corp.*, 545 F Supp 812 (1982, ED Pa), reversed 714 F2d 1240 (1983, CA 3).

The Third Circuit, in reversing the lower court, made it absolutely clear that "a computer program, whether in object code or source code, is a 'literary work' protected from unautho-

rized copying, whether from its object- or source-code version."

Other courts have agreed. "Because the object code is the encryption of the copyrighted source code, the two are to be treated as one work; therefore, copyright of the source code protects the object code as well" [*GCA Corp. vs. Chance*, 217 USPQ 718 (1982, ND Cal)]. The Third Circuit in the *Williams Electronics* case, *supra*, expressly rejected a defense contention that a distinction should be drawn between the different code versions of a computer program. See

also *Midway Manufacturing Co. vs. Strohon*, 564 F Supp 741 (1983, ND Ill) and *Apple Computer, Inc. vs. Formula International, Inc.*, 562 F Supp 775 (1983, CD Cal). These rulings should dispel completely any lingering doubts or confusion concerning this issue.

The courts have also rejected the argument that there should be a distinction for purposes of copyright protection between operating system programs and application programs. The Third Circuit in the *Franklin* case rejected the argument that an

operating system program is uncopyrightable because it is a process, system or method of operation. That argument is misdirected because the copyright does not protect "the method which instructs the computer to perform its operating functions but only the instructions themselves."

It makes no difference whether the instructions relate to the tasks of an application program or to the tasks of an operating system program. The argument that an operating system program is an uncopyrightable machine part "mistakenly" focuses on the physical characteristics of the instruction. "But the medium is not the message."

An operating system program is not a "purely utilitarian" work and the fact that the words or instructions of a program are used in the implementation of a process does not affect copyrightability. The copyright status of written rules or instructions for a "system for the operation of a machine" is unaffected by the fact that those rules or instructions "carry out the process."

All Programs Eligible

It is now "crystal-clear" from the opinion in the *Apple vs. Formula International* case that "all computer programs," fixed in any form by any method, performing any function for any purpose, are entitled to copyright protection. The virtual unanimity of the courts in rejecting the defense arguments relied on thus far makes it unlikely that defendants will continue to urge these contentions in future cases. The total lack of merit or persuasiveness of these misdirected arguments should discourage such use.

As copyright infringement litigation in the software field becomes more sophisticated, it is anticipated that basic copyright principles and issues will become increasingly more important. The courts have in the past been very receptive to fundamental copyright arguments and should continue to be so in the future.

Chief among these basic issues is the requirements of showing a substantial similarity between the works in question. This requirement is the *sine qua non* of copyright infringement. In the absence of substantial similarity, there can be no copying or infringement. In determining this key issue, the court must also apply and rely on other principles of copyright law. One of the most basic of these principles is the concept that copyright protection extends only to the expression of an idea but not to the idea itself.

When the idea and its expression are indistinguishable, protection may be limited to identical copying. Some courts have refused to protect an expression that is inseparable from the underlying idea, since to do so would confer a monopoly of the idea, which is impermissible under copyright law. It has been held that

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the scope of copyright protection "increases with the extent expression differs from the idea." And, conversely, the idea and its expression "will coincide when the expression provides nothing new or additional over the idea." The very complexity of the expression of an idea "will separate it from even the most banal idea" [Atari, Inc. vs. North American Phillips, etc., 672 F2d 607 (1982, CA 7)].

As a corollary, when the use of an idea necessarily requires certain forms of expression, protection may not be afforded if doing so would in effect protect the idea. Where an idea is only capable of expression in more or less stereotyped form, protection against copying that expression will ordinarily not be available. Forms of expression that are inextricably linked with an idea may not be protected. Infringement liability may be avoided where the defendant copies only the idea and uses his own form of expression, or where, because the idea and its expression are inextricably tied, minor variations or differences in expression may be sufficient to negate copying.

An example of the idea/expression dichotomy sufficient to protect against copying is Atari vs. North American Phillips in which the Seventh Circuit reversed the lower court and found substantial similarity between plaintiff's and defendant's works because the latter captured the total concept and feel of the former. Compare Atari, Inc. vs. Amusement World, Inc., 547 F Supp 222 (1981, DC Md), which refused to grant injunctive relief because the similarities of expression were found to be "inevitable, given the idea and the medium." In such cases, the number of dissimilarities becomes particularly significant.

Although drawing the line between an idea and its expression is difficult, it must be done and is generally done on an ad hoc basis. It has been suggested that the focus should be on whether the idea is capable of different forms of expression. Thus, if other programs can be written to express the same idea, the program is an expression and suitable for copyright protection. Where, however, there are no or few other ways of expressing a particular idea, copyright protection will be withheld. Protection may not be available to forms of expression that are necessarily dictated by the underlying idea.

A further corollary to this issue is the question whether in any given case the expression may contain "so little in the way of particularized form . . . as to be only an abstract idea portrayed in noncopyrightable form" [Stern Electronics, Inc. vs. Kaufman, 669 F2d 852 (1982, CA 2)]. See also Midway Manufacturing vs. Bandai-America].

The idea/expression dichotomy has been codified in Section 102(b) of the Copyright Act, which precludes copyright protection for an idea, system or concept. The expression adopted by the programmer is the

copyrightable element and not the process or methods embodied in the program. In determining whether there is a dichotomy or unity between the idea and its expression, the focus should be on the idea that is the subject of the expression. It is only that idea that may merge with the expression so as to render copyright protection unavailable. If other methods of expressing the idea of an operating system are available and have not been foreclosed by the particular expression used, then the idea and its expression have not merged,

and the expression is protectable.

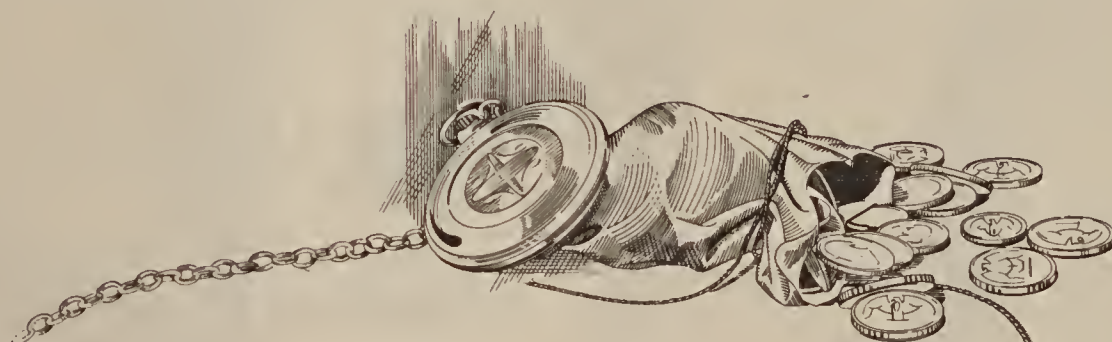
Test of Similarity

The test of substantial similarity in infringement cases is whether the works at issue are so similar that an ordinary, reasonable person would conclude that defendant appropriated plaintiff's protectable expression by taking material of substance and value. The test does not involve analytical dissection and expert testimony, but rather depends on whether defendant captured the total concept and feel of plaintiff's work.

The court in Midway Manufacturing vs. Strohon had little difficulty in finding substantial similarity when, after comparing printouts of the information stored on the ROMs at issue, it found that 89% of the 16,000 bytes in the plaintiff's ROMs were "identically reproduced" in defendant's ROMs. This "degree of similarity, while not absolute, is substantial."

The traditional defense of "fair use," which has now been codified by statute, has particular relevance to computer litigation, especially with

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respect to data bases or other compilations of information. It has been held that compilation works "should be most conducive to fair use" because authors of such works "must be held to grant broader licenses for subsequent use than persons whose work is truly creative" [Dow Jones & Co. vs. Board of Trade, City of Chicago, 546 F Supp 113 (1982, SD NY)]. See also National Business Lists, Inc. vs. Dun & Bradstreet, Inc. 552 F Supp 89 (1982, ND Ill).

Issues relating to works made for hire, specially ordered or commis-

sioned works, joint works and derivative works will also have an impact on software litigation, as will questions of exclusive rights of copyrights and the limitations thereof, elements and burdens of proof in infringement cases, damages and remedies. These and other complex issues will require careful analysis and accurate assessment.

There can no longer be any doubt that all computer programs are copyrightable works of authorship, that chips or ROMs are tangible means of expression, that programs imprinted

on ROMs are fixed in a tangible medium, that the expression of a program is fully protectable whether written in source or object code and that therefore these issues should not be belabored. Copyright litigation involving computer programs will now center on the real issue of whether defendant copied the protectable expression embodied in plaintiff's program — that is, whether the two programs are substantially similar.

The resolution of this issue will depend upon the application of tra-

ditional principles of copyright law.

Copyright law protects computer programs against copying or other unauthorized uses and reflects the congressional intent to encourage continued imagination and creativity in computer programming. As a general rule, anyone is free to create programs that enable a computer to perform the same or similar functions as do other programs. As stated by the National Commission on New Technological Uses of Copyrighted Works (Contu), "One is always free to make the machine do the same things as it would if it had the copyrighted [program] placed in it, but only by one's own creative effort rather than by piracy." That is and will remain one of the central issues in copyright infringement actions involving computer programs.

The main task of counsel in the next generation of computer litigation will be to analyze and evaluate traditional copyright principles as they pertain to software and computer technology. Misdirected arguments that ignore basic copyright law will continue to prove unsuccessful, and litigants who fail to distinguish properly the real issues from the unreal will do so at their peril.

A good example of what may happen when a litigant fails to assess accurately the scope of copyright protection occurred recently in the case of Williams Electronics, Inc. vs. Bally Manufacturing Corp. 568 F Supp 1274 (1983, ND Ill). Plaintiff sued for copyright infringement and other violations of its arcade-type pinball game, which included features of a video game.

The defendant conceded validity of copyright but challenged and sought to limit its scope of protection. The court, applying fundamental principles of copyright law, compared "only the protected elements" of plaintiff's game with the comparable elements in defendant's game and found an "almost complete absence of substantial similarities." The unprotected parts include elements "common to virtually all pinball and video games," the functional elements, and those design features that are neither physically nor conceptually separable from the utilitarian aspects. Accordingly, the court granted summary judgment in favor of defendant and, in a separate order, awarded defendant attorney's fees of more than \$90,000. The court noted expressly that it hoped that "responsible counsel in the field of intellectual property would save [the courts] from frivolity in their field of expertise."

About the Author

Neil Boorstyn is an attorney with the San Francisco law firm Phillips Moore Lempio & Finley. A specialist in copyright and computer law and litigation, he wrote the book Copyright Law, published in 1981 by Lawyers Cooperative Publishing Co./Bancroft-Whitney.

Boorstyn chairs the Copyright Committee of the California State Bar Patent, Trademark and Copyright Section.



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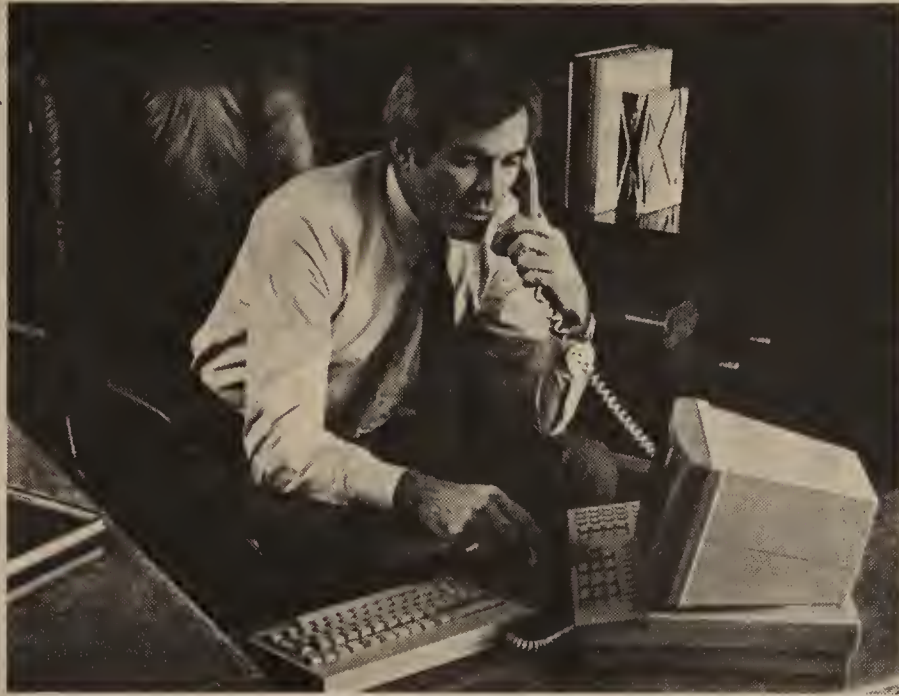
Terminal Offers Voice/Data Melange

HOUSTON — Zaisan, Inc. has introduced a data terminal integrated with an executive telephone, a 9-in. CRT, an internal 300 bit/sec modem, a detached keyboard and support software.

The ES.1 workstation is said to be capable of simultaneous voice/data communication using two telephone lines. This allows the user access to the data base while speaking on the telephone, a spokesman said.

The workstation also features a telephone directory with single keystroke-dialing services including individual authorization codes and data base logon procedures. Auto-redial of the previous 15 numbers called is also included.

Users can maintain a personal calendar/reminder file as well as generate and send electronic messages and memos.



Zaisan, Inc.'s ES.1 voice/data workstation

The data terminal displays 25 rows of 80 characters, a vendor spokesman said.

The typewriter-style, full-travel, step-sculptured keyboard includes 10 function keys

and the control panel has a standard Touch-Tone telephone keypad with 13 programmable telephone functions. The ES.1 comes standard with two modular telephone plugs (RJ11C).

The ES.1 is installed by plugging two telephone lines into the RJ11C plugs and functions with most telecommunications systems, such as a private branch exchange. Upgrades to the workstation itself are accomplished with plug-in modules without opening the casing of the ES.1.

Also included in the workstation is a parallel printer port and a 300 bit/sec, full-duplex modem. Optional features include an internal 1,200 bit/sec, full-duplex modem and an RS-232C serial interface. Included software supports a real-time clock, eight communications profiles, eight automatic logon profiles and a line status/timer.

Memory for the workstation includes 8K bytes of battery backup Cmos random-access memory (RAM), optional 8K bytes of Cmos RAM in plug-in modules and 323K bytes of system read-only memory, the vendor said.

The workstation will be available in 1984 for \$850 from Zaisan, 13920 Champion Forest Drive, Houston, Texas 77069.

Spads Aids Voice Data Entry Design

BEDFORD, Mass. — Verbex, a division of Exxon Enterprises, Inc. has announced the Model 3000 Spads terminal, said to allow users to develop and implement customized, continuous voice data entry applications.

Using the company's speech applications development software, Spads terminal users can design application-specific vo-

cabularies containing 120 words (with options to 360 words), the vendor said.

The terminal allows users to test their applications at successive levels of development and provides evaluation reports of each vocabulary as well as enrollment and training scripts.

Additional features allow users to implement Verbex's digi-

tized voice response, which verifies data entry by repeating the operator's input in a natural sounding voice, according to the vendor.

The price is \$32,000, including Spads software. Further information is available from Verbex, 2 Oak Park, Bedford, Mass. 01730.

Communications Card Links Apple III to BSC Mainframes

CORONA, Calif. — Elcom Systems Peripherals, Inc. has introduced a communications card said to allow an Apple Computer, Inc. Apple III microcomputer to gain access to any mainframe using the IBM 2780, 3780 or 3270 Binary Synchronous Communications Protocol (BSC).

The Commcard II operates independently of the Apple III, using its own Zilog, Inc. Z80 microprocessor, I/O control and memory.

It provides asynchronous RS-232 terminal emulation and costs \$1,195 from Elcom Systems, 439 Harrison St., Corona, Calif. 91720.

Tektronix Announces 4970 Cluster Controller

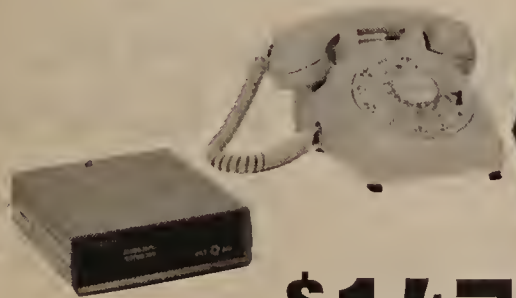
BEAVERTON, Ore. — Tektronix, Inc. has announced the 4970 Cluster Controller, which allows the company's 4010 series terminals and 4100 line of Ascii graphics terminals to operate efficiently in IBM communications environments.

The product and its companion software package connect the terminals to a Systems Network Architecture environ-

ment as if they were IBM 3270-type terminals. Communicating with the host like an IBM 3274 or 3276 Terminal Controller, the 4970 supports up to four asynchronous terminals on a single-pollled synchronous line.

The price for the 4970 and software package is \$6,200 from Tektronix, Mailing Station 63-635, P.O. Box 1700, Beaverton, Ore. 97077.

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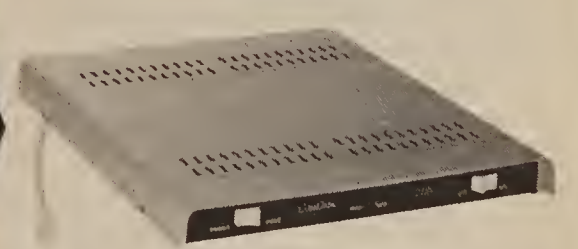
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We saw Australian technology triumph at Newport. Now witness another Aussie breakthrough: The AUSTEC Cobol Environment (ACE).

ACE makes Cobol applications completely machine independent. ACE can be run under nearly all operating systems, but is specially suited to UNIX.

ACEGEN, a fourth generation programming language, is an invaluable component of ACE. It reduces development time for applications software by allowing systems or business analysts to create error-free Cobol applications by simple responses to non-procedural screen prompts.

Using ACEGEN, a systems designer can quickly "prototype" an application so that users may see an operational model without exposure to heavy "cost to create" penalties normally attached to such software development.

ACEGEN allows development investment to be placed into that most important area of design.

Being machine independent, ACE provides a user environment which facilitates the operation of application software across a range of different brand equipment which can include a variety of functional and performance levels spanning super mini, macro mini, micro and PC. Upwards and downwards compatibility is always available such that when business requirements grow or change, the provision of additional computer hardware, at whatever level, need not incur conversion time or costs.

ACE is part of the AUSTEC Commercial UNIX Environment, CUE. CUE provides totally compatible business applications environment operating under UNIX and includes a number of powerful software components.

ACE — ANSI 74 Cobol compiler featuring a multi-user screen driven implementation with all Level 1 and significant Level 2 specifications included.

ACEGEN — a fourth generation language which provides an ability to develop applications in response to a non-procedural series of screen prompts which interact with the designer to facilitate the building of complete business applications.

ACEGEN features:
Data Dictionary
Screen Generator
Report Generator
Enquiry Generator
Forms Printing Generator
File Processing/Up-date
Generator

ACETEL — a high level query language enabling inquiries to be directed either to screen or printer.

ACELOG — a simple, multi-user menu and security system.

ACECON — a powerful, combined menu, logging and security system, providing security controls at menu, program, file and user level together with priority allocation.

UNISAM — a multi-user file management system designed as an upwardly compatible extension of UNIX. UNISAM offers superior performance which is demonstrated by guaranteed disk access, dependent only on record

count (e.g. five accesses for five million records). UNISAM supports indexed, sequential and relative files with fixed length records, and text stream or device files with variable length records. UNISAM conforms with ANSI, Cobol I/O specifications and is multi-user. It allows exclusive access to devices overcoming this common UNIX problem. As UNISAM satisfies all the requirements of an Applications Developer, it provides absolute data compatibility across all developed applications. APPLICATIONS SOFTWARE?

Of course. A design feature of ACE Cobol is its ability to compile and run applications developed under DGC's Interactive Cobol, ACE being a super set of DG's implementation.

For further information contact your UNIX supporting manufacturer or:

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Comdex Fall Conference, Las Vegas,
November 28-December 2, 1983

Tool Out for Upgrading VDTs to IBM Micros

SANTA CLARA, Calif. — Solaris Computer Corp. has introduced its Personal Computer Emulator (PCE), said to upgrade widely used asyn-

chronous video display terminals (VDT) to IBM Personal Computers without disrupting any element of the existing data processing net-

work. The initial product offering is for Digital Equipment Corp.'s VT100 and VT100-emulating terminals.

While the PCE is emulat-

ing the IBM Personal Computer, it permits concurrent transparency to the host and ensures that interaction with the corporate network is undisturbed.

A user can switch at any time from a data entry session on the mainframe to an IBM Personal Computer word processing program and back again without any disruption or loss of data on either side of the system.

One feature of the system is that the screen can be split to show simultaneously information from both the mainframe and the personal computer.

The PCE is now being tested at beta sites and will begin shipping sometime this month at a price of \$2,795. More information is available from the vendor at 2797 Park Ave., Santa Clara, Calif. 95050.

Racal-Milgo Unveils LSI Modems With Omnimax Compatibility

MIAMI — Racal-Milgo, Inc. has introduced a series of modems with large-scale integration (LSI) circuit design, compatibility with the vendor's line of Omnimax multiplexers and backward compatibility with other Racal-Milgo modems.

The Omnimax Integrated Modems come in 2,400-, 4,800- and 9,600 bit/sec models. When used with the Omnimax 30 or 40 modems, switches mounted on the front of the modem card are used to change operating parameters.

The 2,400 bit/sec integrated modem is reportedly compatible with the Racal-Milgo 24 LSI Mark I modem; the 9,600 bit/sec modem is said to be compatible with the vendor's MPS 9601 model.

Pricing for the modems

begins at \$700. More information is available from the

vendor through P.O. Box 520399, Miami, Fla. 33152.

Video Units Beef Up MCS Line

SAN JOSE, Calif. — Compression Labs, Inc. (CLI) has announced two additions to its Mini Conferencing System (MCS) family of compact videoconferencing stations.

The Personal Conference Station, PCS 12, and the Mini Conference Station, MCS 19, are self-contained, portable units that offer complete videoconferencing capabilities, including audio, full-motion video, graphics and control, according to a CLI spokesman.

Each of the stations consists of a central unit housing a color monitor, camera with zoom lens, directional microphone and speaker, the spokesman said. Also provided are a movable stand and a hand-held remote control unit. The PCS has a 12-in. monitor, and the MCS has a 19-in. monitor. Both can support an optional graphics unit for sending and displaying graphics, slides and other printed material.

Both units will be available in the second quarter of 1984 with the PCS 12 priced at \$14,000 and the MCS 19 priced at \$16,000. The graphics unit is available for \$5,500. More information can be obtained from CLI at 2305 Bering Drive, San Jose, Calif. 95131.

Racal-Vadic has the Ultimate 212A. It's like getting a Porsche at Volkswagen prices!



The Auto-Dial VA212... For Those Who Want Everything

Racal-Vadic has the ultimate 212A-compatible modem. It operates at 1200 and 0 to 300 bps and has a built-in automatic dialer with a non-volatile memory that can store as many as 15 phone numbers, up to 31 digits each. Non-volatile means the memory is retained even if you lose power.

This remarkable modem "talks" to the terminal operator using English words and phrases to indicate call progress, option status, and telephone numbers in memory. Calls can be originated or answered from the terminal keyboard or the modem front panel.

The front panel is really something. It has a 16-key tactile-touch keyboard and an eight character liquid crystal display. Twenty-six user programmable options are stored in the modem's memory, and can be keyed in from the front panel... eliminating the need to open the modem to change options.

The VA212LC... For The Economy Minded

For those who don't want auto-dial, Racal-Vadic has the perfect modem. It's called the VA212LC. LC means low cost... just \$495 in single quantity.

This is not a stripped down model. The VA212LC is a full-featured 212A-compatible modem with manual originate and automatic answer. It operates at 1200 and 0 to 300 bps full-duplex.

The VA212LC's extensive diagnostics include remote digital loopback and self test. Remote loopback allows end-to-end testing over the phone from any of Racal-Vadic's regional diagnostic centers. The carrier indicator shows when you've established connection.

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Message Center - btl

From : Message Center 4605

Mgs for harty, steve

Information for callers:

IN MIAMI FROM 5/9 THROUGH 5/12 AT

FOR BRIAN QUINN: NEED CONTRACTS A

FOR NANCY: YOUR TICKET IS AT TRAV

From: QUINN, BRIAN

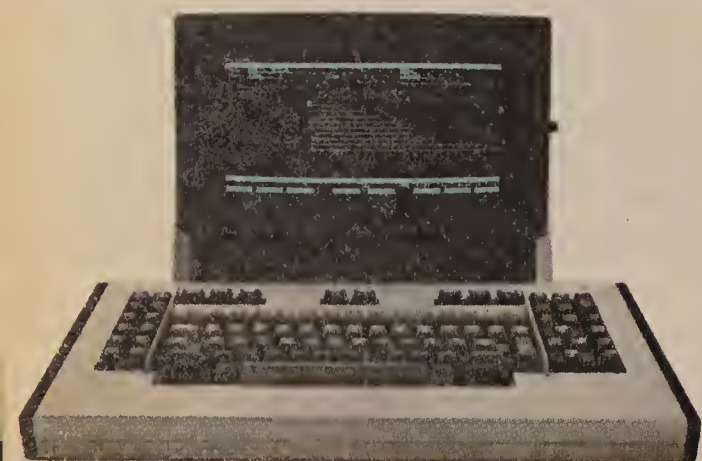
Msg:

CONTRACTS SIGNED. COPIES BEING SE
HOPE YOU GET A SUNBURN.

Tue May 10 08:58 am - btl

:0

Next



Message Center/Directory from AT&T Information Systems displays visible proof that you can be out of town, out of the office,

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It will *never* forget you.

It's a personalized call coverage and information system. With it, one trained attendant can act as a backup personal secretary to you and 149 other busy managers.

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You can retrieve your messages three

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The Directory function adds to Message Center. It's an on-line database that gives you continuously updated information about fellow employees. Information such as name, extension number, location, title, department, and up to ten other fields of information.

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Message Center/Directory is just one of several office management applications available on DIMENSION® 600 and 2000 systems and the new System 85. You can hook up a few individuals or your entire company. It's your choice.

System components and features are customized to fit your needs.

The *Information Controller* is the switching hub of the system. It is connected to the *Applications Processor*, a fast, powerful minicomputer with software that supports several new user-controlled applications.

Its UNIX™ operating system creates a fully interactive multi-user environment.

You can attach any combination of peripheral devices: voice-only terminals, voice terminals with 40-character displays, data terminals with full CRT screens like the 500 BCT pictured above, or new intelligent terminals that combine voice and data functions in an integrated workstation. And there's a full line of printers.

Message Center/Directory was developed by Bell Labs systems designers who now work for AT&T Information Systems

Laboratories. Built by AT&T Western Electric and maintained by the largest service organization in the industry, it's part of a fully integrated product line designed to help your business do business better.

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Omnet Introduces E-Mail Service

BOSTON — Omnet, Inc. has introduced an electronic mail service called Businessnet, which is tailored to each individual company's needs.

Features of Businessnet include public and private bulletin boards, mailing lists and specifically designed forms for order entry, sales force itineraries and other purposes.

Customers are able to access the service via the GTE Telenet public data network using any manufacturer's type of equipment, a vendor spokesman said.

An average active user, composing on-line and sending three or four short messages per day, would spend about \$50 per month, according to

the vendor. There is also a connect-time charge of \$15.40 per hour during business hours. If more than one copy of a message is sent, there is a charge of six cents per additional

Remote Communicator Out for DEC

NORCROSS, Ga. — Reynolds, Taylor and Lovell, P.C., has introduced a communications package said to run on Digital Equipment Corp.'s PDP-11 minicomputer under the RT-11 operating system.

CTScm enables the user to communicate, via telephone/modem hook-up, with any remote computer, allowing the transfer of data files to

copy; there is also a charge of six cents for each additional 1,000 characters transmitted out of the system.

Omnet can be contacted at 70 Tonawanda St., Boston, Mass. 02124.

or from the remote system. CTScm also reportedly permits the printing of data transmitted from the remote computer, as well as the creating, editing and listing of local data files.

A single-copy license fee for CTScm is \$750. The package is available from Reynolds, Taylor & Lovell at 3800-C Holcombe Bridge Road, Norcross, Ga. 30092.

Complexx Modem Offers Choice Of Eight Speeds

HUNTSVILLE, Ala. — Complexx Systems, Inc. has introduced a limited-distance modem said to allow the user to select from eight synchronous speeds (2,400 bit/sec to 76.8K bit/sec).

The LVS 76.8 modem reportedly allows the user to choose any speed by using a thumb-wheel switch on the unit's front cover. At its 76.8K bit/sec maximum speed, the modem can reportedly send data 16,250 feet on typical 22-gauge wire.

The user has the choice of an EIA RS-232C digital interface or a V.35 interface.

Priced at \$650 for the RS-232C interface version, the modem is available from Complexx Systems at 4930 Research Drive, Huntsville, Ala. 35805.

Intertel Units Add Diagnostics To Transmission

ANDOVER, Mass. — Intertel has announced a new family of data service units said to permit data communication users to receive direct digital service supported with diagnostic and control features similar to the vendor's analog modems and network control systems.

The DSU500 units reportedly operate at speeds up to 9,600 bit/sec, and the DSU556 operates at 56K bit/sec.

Central site control of diagnostic testing can reportedly be achieved by equipping remote DSUs with optional diagnostic cards and installing one or more optional central site controllers, each capable of supporting 16 DSUs.

The units are priced at \$785 for the DSU500 and \$895 for the DSU556. Additional information is available from Intertel, which can be reached at 6 Shattuck Road, Andover, Mass. 01810.

Fiberlink Fields Data Systems

WESTBURY, N.Y. — Fiberlink, a division of Math Associates, Inc., has announced a family of RS-232-compatible data transmission systems.

The products consist of half- and full-duplex data modems, data taps, repeaters and the model XR-1150 direct plug-in, fiber-optic interface module.

The components feature low cost, high security, immunity to electromagnetic interference and radio frequency interference and transmission distances in excess of 2 kilometers at data rates of 19.2K bit/sec, the vendor said.

Prices for the system components range from \$349 per pair for the XR-1150 fiber-optic interface to \$950 per pair for the RS-232 modem.

Further information is available from Math Associates, which is located at 2200 Shames Drive, Westbury, N.Y. 11590.

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Tele-Tech Data Base Adds Post-Divestiture Info

FRANKLIN, N.J. — Tele-Tech Service, Inc. has introduced an expansion program for its tariff data base. The vendor is now distributing data

base information on the eight AT&T Communications interstate tariffs. The data base details the rates and services that will be offered by the

company after divestiture. Originally filed to become effective Jan. 1, the tariffs have been postponed and are now due to become effective April 1.

Also being acquired by Tele-Tech and distributed to the general public are details of AT&T Communications' intrastate tariffs, which will define rates for the intrastate, inter-local-access and transport area services and the local operating company interstate tariffs.

In addition, Tele-Tech will be distributing information on access-charge tariffs and tariffs of other common carriers such as MCI Communications Corp., GTE Telenet Communications Corp., Sprint System, Western Union Corp. and Satellite Business Systems.

Clients may order information on an entire tariff or on any section on a one-time basis with Tele-Tech's automatic revision service. The initial cost of the intrastate tariff data base is approximately \$290 for any one state (the cost varies slightly depending on the state); the price of the interstate tariff information ranges from \$50 to \$125; and the revision service is 25 cents per page.

For telecommunications users who do not wish to purchase the tariff data base, the vendor is offering "Tele-Facts," a newsletter that presents a digest of news related to rate and tariff activity, for \$35 per year.

More information is available from the vendor through P.O. Box 366, Franklin, N.J. 07416.

Honeywell Data Link Out For Fiber-Optic Evaluation

MINNEAPOLIS — Honeywell, Inc. has introduced a data link said to allow users to evaluate a set of 1-bit to 5M-bit digital fiber-optic components.

The kit consists of an HFI 6000 digital, 8-pin integrated circuit driver, an HFD 4000 receiver chip, a standard Sweet Spot light-emitting diode, a printed-circuit board and five meters of terminated glass cable, the vendor said.

The kit allows users to construct a

completely transistor-to-transistor-logic-compatible serial, digital data link that will operate with the glass cable furnished with the kit, according to the vendor.

The price is \$89. Further information is available from Honeywell, Honeywell Plaza, Minneapolis, Minn. 55408.

Converter Boasts Coaxial Link To IBM Ports

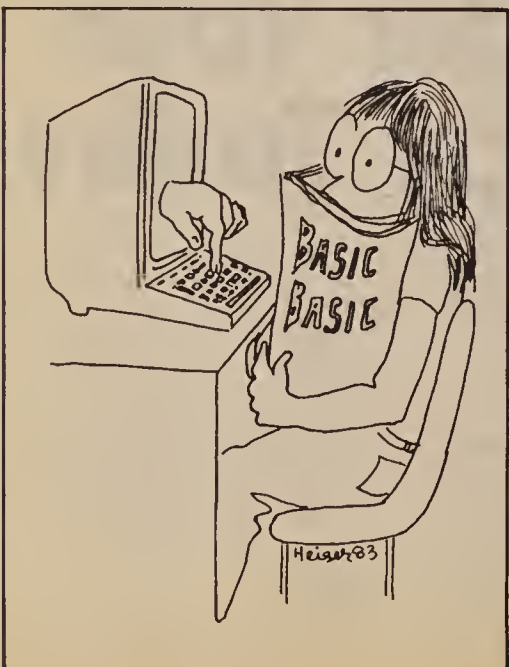
TORRANCE, Calif. — Local Data Co. has introduced a protocol converter said to enable asynchronous Ascii devices to be linked to IBM control units via coaxial cable.

The Interlynx/3278 protocol converter performs multiple interface and protocol conversion functions necessary for plugging asynchronous minis and microcomputers, CRT word processors, port selectors, modems and hard-copy terminals into the IBM Type A coaxial cable port. No hardware or software changes are necessary, according to the vendor.

The asynchronous devices are made to emulate the IBM 3278-2 display terminal. When supporting asynchronous terminals, the Interlynx/3278 provides the same full screen formatting and keyboard functions as the 3278-2.

An optional IBM Personal Computer transfer package and support for all IBM Personal Computer compatibles, the Xerox Corp. 860 and the IBM Displaywriter are available.

Price of the Interlynx/3278 is \$1,395, with delivery from stock. Information is available from Local Data, which is located at Suite 706, 2701 Toledo St., Torrance, Calif. 90503.



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Include Tester for SNA Network Three Software Packages Out for Chameleon

SANTA MONICA, Calif. — Tekelec, Inc. has introduced three software packages for its Chameleon simulator/analyzer.

The first, TestSNA, which is developed by System Strategies, Inc. for Tekelec, is a series of 115 scenarios to test all functions of an IBM Systems Network Architecture (SNA) and IBM 3274- or 3276-compatible products. The package provides a completely documented system for quality assurance or product verification, the vendor said.

The second, Chameleon, runs TestSNA connected directly to the cluster controller-type product. No host or front-end processor is report-

edly required.

According to the vendor, rigid scenario testing of SNA is the most effective means of evaluating and troubleshooting a controller or emulator. Each layer of SNA, including Synchronous Data Link Control (SDLC) is tested individually from the bottom up so that higher layers are tested with the assurance of a secure foundation.

The other new software package, Replay, provides the user with a method of simulating a particular problem or event without having to write any software. It takes a prerecorded analyzer file and replays either the data terminal equipment or

data circuit equipment side while comparing the responses to those on the disk.

The Chameleon simulator/analyzer, TestSNA and Replay sell together for \$27,000. Separately, TestSNA

sells for \$10,000. Replay, included with all new Chameleon systems, can be purchased by current Chameleon users for \$50.

Tekelec is based at 2932 Wilshire Blvd., Santa Monica, Calif. 90403.

Belden Announces Cable For Local-Area Networks

GENEVA, Ill. — Belden Corp.'s Electronic Wire and Cable Division has introduced a transceiver cable for use in such local-area networks as Xerox Corp.'s Ethernet.

The Belden 9898 reportedly has three individually shielded twisted pairs and one shielded twisted triplet. The cable's aluminum and polyester foil tape shields make electrical contact with one another.

Standard setups are at 100, 500 and 1,000 feet, with trade prices of \$50.25, \$180 and \$360. Further information is available from the vendor at 2000 S. Batavia Ave., Geneva, Ill. 60134.

Gandalf Unveils PIN Enhancer With Autobaud

WHEELING, Ill. — Gandalf Technologies, Inc. has announced an enhancement package for the PIN 9103 statistical multiplexer said to include autobaud, enabling the PIN to adjust its channel operating speed automatically to that of the terminal.

Available as a standard feature of PIN multiplexers, the enhancement also includes selectable autobaud passthrough, a choice of connect protocols and a Help command for console users.

Available in four- to 32-channel rack-mount or stand-alone units, the PIN 9103 ranges in price from \$1,650 to \$7,250. More information is available from Gandalf Data, 1019 S. Noel, Wheeling, Ill. 60090.

CGX System 2001 Gets Connection To Bell Facilities

ACTON, Mass. — CGX Corp. has announced that Bell T1 and fiber-optic cable connections are available for its Graphics Display System 2001, an IBM-compatible system of mainframe-based, interactive, computer-aided design and manufacturing workstations.

CGX supplies a T1 adapter connected to the host-based channel unit or to any point along the single coaxial cable. The adapter connects to a Bell-supplied channel service unit modem, which passes data to the local Bell digital transmission facility. Bell transmits information at 1.544M bit/sec over its T1 service.

Using either of these long-distance connections, remote CGX display networks can operate from a central IBM 30 or 4300 series or IBM plug-compatible mainframe host.

Cost of the T1 and fiber optics options is \$3,500. CGX is located at 42 Nagog Park, Acton, Mass. 01720.

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Family of Gateway Devices Provides X.25 Connections

ALEXANDRIA, Va. — Dynatech Packet Technology, Inc. has introduced a family of gateway devices said to connect different types of Ansi X.25 networks and also interconnect different services within an X.25 network.

The Multicom 25 has two models. Model 2 translates numbers called between a public or private X.25 network or between two different public X.25 networks. It contains a programmable "table" with up to 200 numbers and their corresponding matching numbers, all protected by their battery-packed random-access memory.

The Model 4 can interconnect per-

manent virtual circuits (PVC) switched virtual circuits within a network. With the Model 4, host computers that only support one type of dateline can be interfaced to devices and networks which support the other dateline type.

Future models will interconnect X.21 circuit-switching networks to X.25 packet-switching networks.

The Multicom 25 Model 2 is priced just under \$6,900 and the Model 4 just under \$7,200, with delivery in 60 days.

More information is available from Dynatech Packet Technology at 6464 General Green Way, Alexandria, Va. 22312.

Calcomp Offers Multiplexer

ANAHEIM, Calif. — California Computer Products, Inc. (Calcomp) recently announced an input multiplexer that connects up to four data sources to its Model 951/953 controller.

The 4 to 1 Input Multiplexer contains four input ports which reportedly may be independently configured to accept serial data in Calcomp's 960 or 907 format. Each port may be independently configured by switches or jumpers according to transmission rate, half/full duplex and character framing.

A company spokesman said a priority scheme allows users to select ports for preferential plotter access. A dead host timeout feature reportedly allows users to recover from host errors by automatically releas-

ing a port if data is not received within a user-specified interval.

The unit is available for \$1,995 from Calcomp at 2411 W. La Palma Ave., Anaheim, Calif. 92801.

Info-Mate 212PC Offers Direct Tie To IBM Micros

SUNNYVALE, Calif. — Cermetek Microelectronics, Inc. has introduced Info-Mate 212PC, a Bell 212A-type modem that plugs directly into the IBM Personal Computer, Personal Computer XT or compatible computers.

The product is supplied with the company's data communications software package called Modem-Mate, which allows personal computer users to transmit and receive files, autodial data or voice calls, receive or transmit information at full or half-duplex, log modem data on a printer and maintain a 60-entry "phone book," the vendor said.

Additional personal computer requirements needed to operate this product are 64K bytes of random-access memory, one disk drive and an 80-col. display. The price is \$495.

Cermetek Microelectronics is at 1308 Borregas Ave., Sunnyvale, Calif. 94089.

Converter Joins CRT, Printer Over One Line

TORRANCE, Calif. — Local Data Co. has announced the Datalynx 3274 protocol converter, which allows support of a CRT and an auxiliary printer over one asynchronous telephone line.

The product supports the serial and parallel auxiliary printer ports on terminals and personal computers as separately addressable 3287-2 printers, the vendor said.

The terminal display and printer appear as separate logical units to the IBM host computer.

This allows up to 18 devices to be addressed simultaneously by the host through the nine asynchronous ports on the protocol converter, according to the vendor.

Prices for the converters are: 3274-9, \$6,000; 3274-7, \$5,000; 3274-5, \$4,000; and the 3274-3, \$3,250.

Further information is available from Local Data, Suite 706, 2701 Toleado St., Torrance, Calif. 90503.

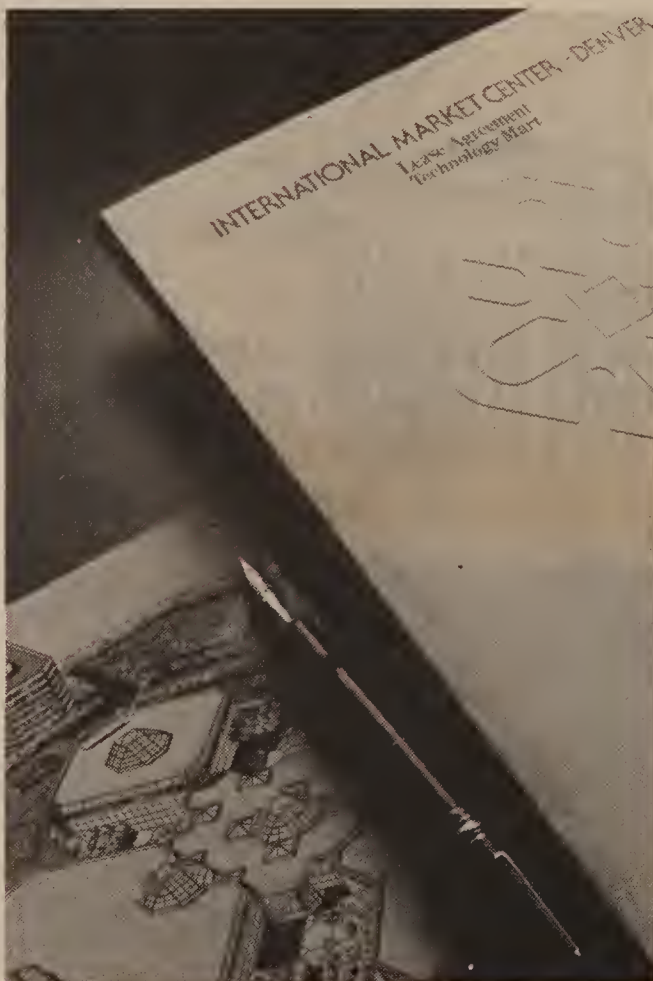


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Tempo Response Time Monitor Upgraded

CHERRY HILL, N.J. — Avant-Garde Computing, Inc. has introduced Tempo II, an updated version of its

original Tempo response time monitor for individual terminals. Installed directly at the

terminal, this microprocessor-based "electronic stopwatch" gives response time measurements as actually ob-

served by the terminal operator.

Tempo II identifies each transaction by transaction type and transfers the gathered statistical information to the host for further analysis.

The product gives actual, minimum, maximum and average response times, the standard deviation variance, response time distribution and a breakdown of distribu-

tion by percentage, the company said.

Available immediately, Tempo II units are compatible with a variety of terminals, including the IBM 3178, 3276, 3278, 3279, 8775, Teletype Corp. 4540 and Memorex Corp. 2078. A single Tempo response time monitor costs about \$3,700. Avant-Garde is located at 2091 Springdale Road, Cherry Hill, N.J. 08003.

Communications Tools Fit AD/380

DENVER — Auto-Trol Technology Corp. has announced two software communications packages for use with its AD/380 product line.

These packages — the V/77 communications package and the IBM communications package — enable Auto-Trol systems to transfer data files between one another or between themselves and IBM-like host computers.

The V/77 package enables users to transfer data files, using cable or modem hook-ups, between Sperry Corp. V/77 computers, or between a V/77 and Digital Equipment Corp. VAX computers.

The package provides a communications path between Auto-Trol V/77-based

systems and IBM or IBM-like host computers. With this package, Auto-Trol users can transfer files using any of three IBM standard communications protocols.

The V/77 package costs \$2,000 for each link, while the IBM package is priced at \$8,000 from Auto-Trol, 12500 N. Washington St., Denver, Colo. 80233.

EDU-Link Designed For Teaching

TEMPE, Ariz. — Advanced Fiberoptics Corp. has announced the EDU-Link, a Transistor-to-Transistor Logic data transmission system designed as an educational tool.

The product package includes a transmitter, receiver and a one-meter length of preterminated fiber-optic cable.

The kit is sold in unassembled format, demonstrating the principles of fiber-optic transmitter and receiver design, the vendor said.

The price is \$19.95 and includes instructions, theory of operation and tutorial information, according to the vendor.

Advanced Fiberoptics can be reached at 637 S. Hayden Road, Tempe, Ariz. 85281.

Controller Touts High-Speed Use

SAN DIEGO — Systech Corp. has announced a serial communications controller said to support high-speed asynchronous and synchronous data communications.

The MTI-800/1600 DMA controller reportedly supports eight or 16 serial ports and time-division multiplexing firmware.

Priced at \$1,895, the MTI-800/1600 controller is available from Systech Corp., located at 7630 Miramar Road, San Diego, Calif. 92126.

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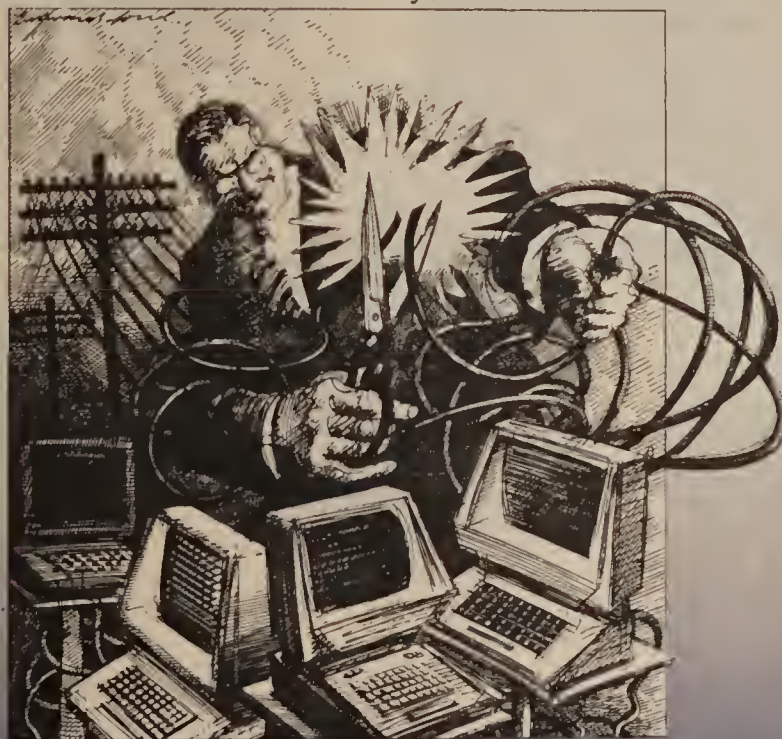
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Dataroute International Gets Third Border-Crossing Point

MONTREAL — Telecom Canada has announced the availability of a third border-crossing point for its Dataroute International service.

The new connection is between Montreal and Albany, N.Y. The digital network, used by businesses for point-to-point data transmission, currently links 82 Dataroute serving areas across Canada to 93 digital serving areas in the U.S., according to a Telecom spokesman.

A typical connection between Canada and the East Coast costs approximately \$1,000 per month, and a connection between Montreal and the West Coast is priced at approximately \$3,500 per month.

More information can be obtained from Telecom Canada at 160 Elgin St., Room 1150, Ottawa, Canada, K12 3J4.

IBM Connected Via 'Tele3270'

SUNNYVALE, Calif. — Televideo Systems, Inc. has introduced a software package said to allow Televideo personal computer networks to connect with IBM 3270 terminals.

Tele3270 reportedly emulates 3270 terminals, enabling users of Televideo's personal computer network to access 3270 applications and data bases on IBM mainframes.

Tele3270 is said to feature Digital

Facility Allows Interchange

VAN NUYS, Calif. — Cisinetwork Corp. (CNC) has introduced Soft-Switch, a networking facility that allows users with different brands of word processing equipment and personal computers to interchange documents via CNC's host computers

without regard for dissimilar formatting codes and communications protocols.

Using Soft-Switch, developed by Integrated Technologies, Inc. of King of Prussia, Pa., CNC can also temporarily store and permanently archive documents.

CNC supports Soft-Switch under IBM's MVS and VM/CMS operating systems at its computing centers in Philadelphia and Los Angeles.

The usage fee is 25 cents per resource unit plus a software surcharge for the use of Soft-Switch.

Further information is available from CNC, at 16625 Saticoy St., Van Nuys, Calif. 91406.

Mux System Fits Users Of PTS-2000

HYANNIS, Mass. — Fibronics International, Inc. has announced its Cable Bandit multiplexer system for Raytheon Data Systems Co. PTS-2000 users.

The system allows up to 32 dedicated coaxial cables connected to Raytheon R2078 and R2079 display terminals and R2187 printers to be replaced by a single fiber-optic or coaxial cable, with terminals located up to 10,000 feet away from the R2074 or R2076 controller.

The system is available in two configurations: the FM-1632 is expandable in eight-port increments up to a maximum of 32 ports; and the FM-1608 is a fixed, eight-port system for multidrop networks.

Priced at \$4,200 for a basic system, the Cable Bandit is available from the Fibronics International at 218 W. Main St., Hyannis, Mass. 02601.

Telemac Offers Data Logger

SUNNYVALE, Calif. — Telmac, Inc. has introduced a 4-channel remote data logger.

Called the TM 4041, the data logger reportedly includes an analog-to-digital converter and interfaces with micro, mini and mainframe computers through an RS-232 serial interface.

Designed to monitor analog variables, the Data Logger is oriented for transducer applications and can monitor variables such as temperature, infrared emissions, vibration and power-consumption data on-site or via 300 to 1,200 bit/sec modems, the vendor said.

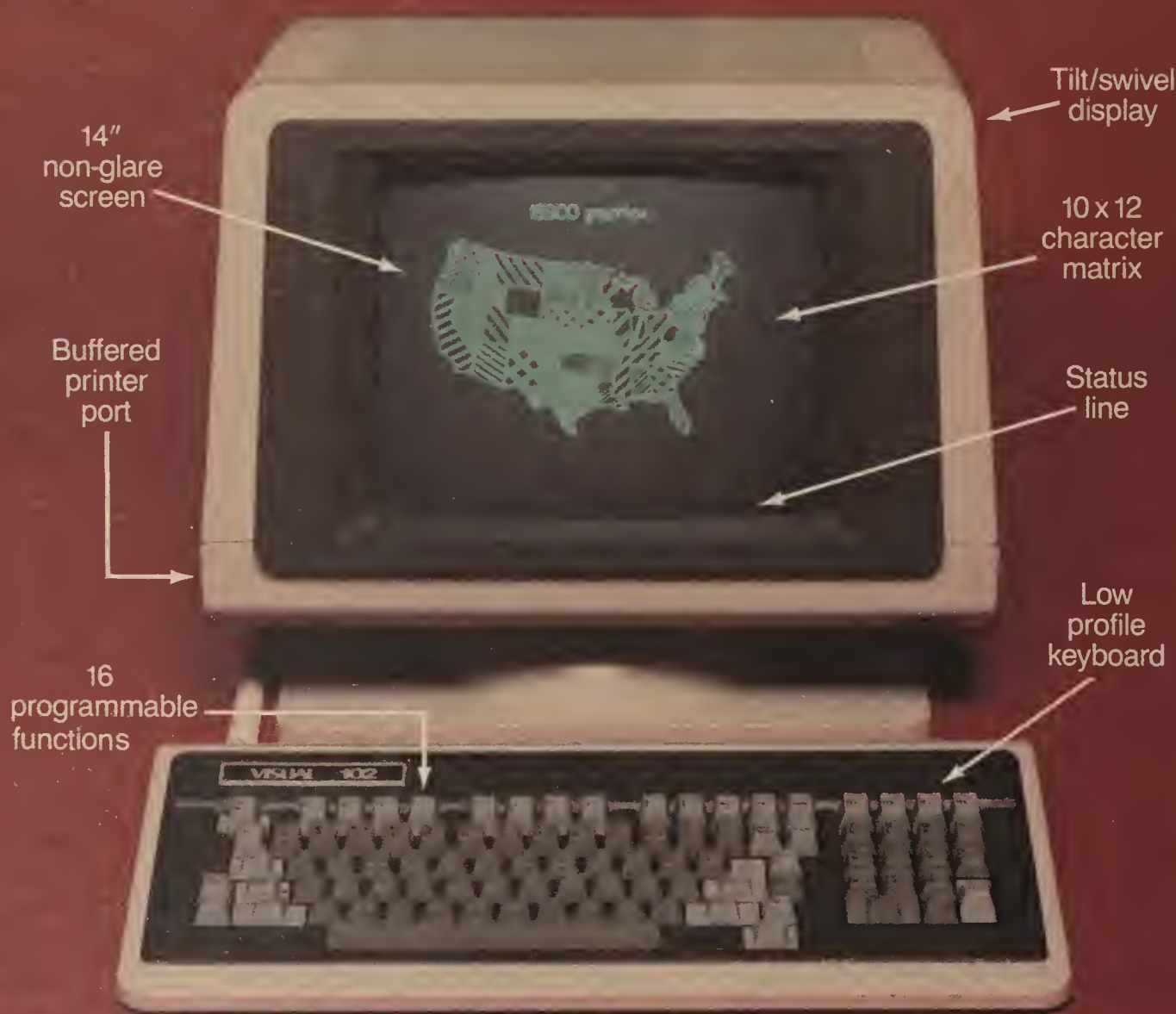
Control of the Data Logger is through Basic commands, the vendor said.

The memory retains information in an Ascii string format, which can be easily converted to a real-number format via Basic language output commands, according to a vendor spokesman.

The TM 4041 Data Logger is available for immediate delivery at a cost of \$500 per unit, according to the vendor.

More information is available from Telmac, located at 770 Privet Court, Sunnyvale, Calif. 94086.

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Users Rate Level of Services

Study Discusses After-Sales Support Blues

By Patricia Keefe
CW Staff

MOUNTAIN VIEW, Calif. — Users of small computer systems rate the level of after-sales support services they receive as being below what is needed in almost every area, particularly software, according to a report recently released by Input, Inc., a computer market research firm here.

The report, "An Analysis of User Requirements for Small-Scale Systems," recommends vendors embrace a total service concept that "extends far beyond reacting to reported machine failures and recognizes the dynamics of [changing] user requirements." The "perfect candidate" to provide total after-sales support is said to be the field engineer, and the more successful vendor organizations have already incorporated this concept, Input added.

The study examines what 342 small systems users, primarily managers, want in field-service support and provides their ratings of how well 14 vendors perform in each of 13 specific service areas.

Small-scale systems were defined as stand-alone computers such as traditional minicomputers and business microcomputers. The service areas include physical-site planning, hardware maintenance, software maintenance, supplies sales, add-on sales, site audits, environmental planning, consulting, training, documentation, installation planning, deinstallation and relocation.

The survey respondents indicated that all vendors performed poorly on documentation, supplies sales, relocation and deinstallation. The users

also indicated that vendors need to pay more attention to taking the initiative to improve user operations. Input warned service vendors that they are not adequately protecting their

installed bases.

In addition, users rated effective communication with software engineers, ability to maintain software and response time to solve software-related prob-

lems lower than that for hardware. Also, according to Input, there is a shortage of qualified people in software support. Yet, "with an aggressive training (Continued on Page 86)

VENDORS	RATINGS (1-10)				NUMBER OF RESPONSES
	MEAN	STANDARD DEVIATION	MEDIAN	MODE	
All Vendors	6.79	2.07	7.0	8.0	251
Autotrol	5.00	1.84	5.0	5.0	21
Burroughs	6.55	2.21	7.0	7.0	20
Computervision	6.21	2.04	6.0	5.0	19
DEC	7.30	2.22	8.0	8.0	20
Data General	8.56	0.88	9.0	9.0	9
Datapoint	7.27	1.96	8.0	8.0	15
Four Phase	6.65	2.40	7.0	9.0	17
Hewlett-Packard	7.05	1.75	7.0	6.0	19
Honeywell	6.50	2.04	7.0	7.0	24
IBM	7.79	1.50	8.0	7.0	29
Intergraph	6.22	1.99	6.5	8.0	18
NCR	6.27	2.46	7.0	7.0	15
Prime	7.27	1.58	7.0	7.0	15
Texas Instruments	7.40	1.78	8.0	8.0	10

Chart Courtesy of Input, Inc.

User Ratings of the Ability to Maintain Software

Are Micros Really Better Than CRTs?

By John Butler
Special to CW†

CRT terminals may be good, but micros are better.

In order to defend this statement, it is necessary not only to define the terminology but to define more specifically the environment for which the claim is made. The environment addressed is the small to medium-size business environment.

Microcomputers can run many applications, including financial modeling and planning, data base management and telecommunications. Word processing has not been mentioned. Few companies use microcomputers for word processing, even though it is an important business activity.

At the same time, few firms use CRT terminals connected to a mainframe computer for word processing purposes. Normally, word processing is handled by several stand-alone word processors used in conjunction with electric typewriters.

A very recent trend is to use a newer generation of more powerful microcomputers capable of supporting most of the normal business activities in addition to

This is the first in a three-part series focusing on the link between microcomputers and mainframes. This week and next, the author explores the struggle between micros and CRT terminals as doorways to a corporation's mainframe-based information.

word processing. The operative buzzword is integration — the development of the integrated multifunction workstation.

Advertisements for new computer systems often give the impression they can do anything. Businessmen are more willing to learn to use a computer when it is a single unit that can help perform many normal business functions.

After analyzing our firm's use of microcomputers, we discovered four categories of use, not including word processing. By far, the largest category of use (about 80%) was for a combination of financial modeling (spreadsheet analysis) and financial

planning. The second category was the use of data base management systems (about 7%); the third category was telecommunications (about 6%); and the last category was a conglomeration of everything else, from graphics to actual higher level language programming.

While these numbers are not typical of all businesses, they are probably most reflective of the recent developmental history regarding business software for microcomputers.

Historical Perspective

It is valuable to review the relatively short history of the microcomputer. While many articles have described the sudden emergence of micros into common business-oriented practice, it is necessary to remember that the first practical micro for business use — Apple Computer, Inc.'s Apple II — was released to a business community ill-prepared for it. That was only about six years ago. Prior to 1977, the use of micros in business was a well-kept secret.

(Continued on Page 88)

Point 4 Tops Line, Offers Entry-Level Mini

IRVINE, Calif. — Point 4 Data Corp. has announced two computer systems: the Mark 2T, an entry-level multiuser minicomputer; and the Mark 9, a top-of-the-line system that can support more than 64 users.

The Mark 2T employs bit-slice technology with a microsequencer to effect a 600-nsec instruction execution cycle. The unit also features a 200-nsec random-access memory access time. The system's multiuser architecture, in combination with a direct memory access (DMA) multiplexer, enables the Mark 2T to handle up to seven users within a typical business application, the vendor said.

The Mark 2T incorporates a 5¼-in. Winchester disk drive with a Storage

Technology Corp. ST506 interface and memory capacities from 19M bytes to 46M bytes. Back up and program load capabilities are provided by a "floppy tape" streamer cartridge subsystem with 20M-byte capacity, the vendor said.

The Mark 2T, in a basic four-port configuration, costs about \$10,000.

The high-end addition to the product line is the Mark 9. Representing a 25% increase in power over the earlier Mark 8, the unit is a 16-bit, general-purpose minicomputer.

The Mark 9 system offers selectable operational modes, including a Control Data Corp. Nova 3-compatible mode and an extended instruction set, which increases throughput by reducing software overhead.

The unit is available with Winchester disk and streamer mass storage subsystem in 35M to 84M byte/spindle capacities and high-speed DMA multiplexers to support more than 64 users.

The Mark 9 computer is priced at \$7,500 for a 256K-byte CPU board

and \$30,000 for an entry-level configuration with 256K-byte CPU, eight ports, 35M-byte Winchester disk and controller and 20M-byte tape streamer and controller, which will be available in 30 days.

Point 4 is located at 2569 McCabe Way, Irvine, Calif. 92714.

Mux Channel Interface Links Plotters to IBM CPU

ANAHEIM, Calif. — California Computer Products, Inc. (Calcomp) has introduced a byte or block multiplexer channel interface that gives IBM mainframe users the ability to

utilize the firm's electrostatic or pen plotters on-line.

Designed for use with Calcomp's Model 951 and 953 controllers, the IBM channel interface is a single printed-circuit board that mounts in either the 951 or 953 vector to raster controller, according to the vendor.

With the channel interface installed, the 951 or 953 controller emulates an IBM 3811/3211 controller/printer.

Ebcdic print or plot data may be sent to the controller, the vendor said.

In plot mode, the interface gives IBM 360/370, 30 Series and 430 Series users access to Calcomp's line of electrostatic plotter/printers and pen plotters.

The channel interface costs \$5,995 and includes a set of 20-ft bus and tag cables, a 30-ft cable and software. Delivery is in 60 days.

Calcomp is located at 2411 W. La Palma Ave., Anaheim, Calif. 92801.

Turnkey System Out for CAD, Board Designers

PLEASANT HILL, Calif. — Paragon Technology Corp. has introduced the Model 200 turnkey, color computer-aided design (CAD) system for printed circuit board designers.

The system was built around a 20 MHz Digital Equipment Corp. LSI-11/23 CPU, with an independent 16-bit proprietary graphics processor.

It has 256K bytes of memory, enabling the user to design boards that measure 32 sq in. and contain up to 500 equivalent integrated circuits and 64 layers, according to the vendor.

A separate video display console reportedly permits data entry and system control.

A desktop line printer is used to produce a wiring list, bill of materials and other documents required for manufacturing, according to the vendor.

A keyboard, combined with a mouse or tablet, is used to interact with on-screen menus to move, delete or manipulate the graphics, according to the vendor.

The price for the Model 200, which includes printed circuit design software, a line printer and a factory training course is \$59,950, the vendor said.

Further information is available from Paragon Technology, located at 2199 Norse Drive, Pleasant Hill, Calif. 94523.

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- The January 1 divestiture of AT&T. What will the impact *really* be?
- When is the shakeout going to come in the Micro market? Who will the big players be and who'll be dropping out?
- The results of the Computerworld DP Budget Survey: Where is the DP/MIS exec's money going to go? Why?
- Technology. Just what are the R&D people *actually* working on?

Last year's software announcements and/or agreements will be looked at in light of

which will come to reality in 1984. You'll get a close look at control, security and training issues and how they'll impact DP/MIS managers who spent 1983 off-loading applications to end-users and providing them with computing power.

The entire editorial staff of Computerworld is working full time to review the key events of 1983 and how they'll affect your business in 1984. So you'll get all the insight you need to do your strategic planning for the year ahead.

If you've got product or service ads that will help our readers make informed choices for 1984 — then you need to get color ads to us by December 9th and black and white ads to us by December 15th.

To reserve space in the combined December 26th/January 2nd special issue, call one of the sales offices listed below, or call Don Fagan, Vice President Sales/Marketing; Ed Marecki, National Sales Director or Kathy Doyle, Marketing Support Manager.



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DG Brings Out Eclipse C/30, Based on Microeclipse CPU

WESTBORO, Mass. — Data General Corp. has announced the Eclipse C/30, a multiworkstation microcomputer based on the firm's Microeclipse central processor.

The system was designed to operate with between four and 10 users and fits into DG's product lineup between its Desktop Generation micro and the Eclipse MV/4000 supermini.

The C/30 is supported by DG's AOS operating system, Rdos or MP/AOS and uses a commercial instruction set, which reportedly allows users to run Ansi Cobol and RPG-II programming languages.

The Eclipse C/30 supports up to 2M bytes of main memory and up to

150M bytes of disk storage. The unit includes a floating-point accelerator. An optional-burst multiplexer channel reportedly extends the I/O bandwidth to 4M byte/sec for enhanced I/O performance.

An Eclipse C/30 with 512K bytes of memory in an 8-slot chassis costs \$10,300. A C/30 AOS-based system with 512K bytes of main memory, the burst-multiplexer channel option, a 50M-byte Winchester disk drive, a 15M-byte tape cartridge, a workstation, cabinet and license for the AOS operating system and nine software entitlements costs \$33,770.

DG is located at 4400 Computer Drive, Westboro, Mass. 01581.

McAuto Offers DDP System

ST. LOUIS — McDonnell Douglas Automation Co. (McAuto) has announced McAuto System 1, a mini-computer-based distributed data processing (DDP) system for the engineering community.

The product also offers the company's engineering and project management software applications on Digital Equipment Corp.'s VAX-11 series computers.

The product tracks computer usage, personnel assigned and job status associated with each task within a project and/or subproject environment. It also provides a hierarchical security system that enables the firm's management to control access to project files, use of specific software applications and data processing transactions, the vendor said.

Prices for the McAuto System 1 software plus VAX-11 series mini-computers range from \$100,000 to \$400,000. The software alone is available on a monthly license basis that ranges from \$1,000 to \$2,000.

Further information is available from McAuto, St. Louis, Mo. 63166.

Service Levels After Sales Seen Disappointing

(Continued from Page 83)

program in software support for field engineers, hardware and software maintenance could be combined," the report said, "allowing software analysts to concentrate their efforts on sales teams and in closing new accounts."

And, as hardware becomes easier to maintain, the field-service expertise can be used to concentrate more heavily on software support and on various sales roles. "In this increased role, field service should improve sales of upgrades and add-ons," the report said. Moreover, Input suggested that increased productivity and improved user relations could result from combining several after-sales support services.

Traditional on-site maintenance is favored by all users, pointing out the value of personal contact, the study said. On the other hand, remote support, mail-in repair and support centers leave the user responsible for final problem determination, the study added.

"This affects the users' productivity and requires them to build a high level of [maintenance] expertise within their own organizations," the research firm said. As a result, Input speculated that future sales of new equipment and upgrades could be "significantly" affected by these losses in communication between the vendor and user.

One suggested solution is to follow the example of the large systems sector, where field engineers carry out account management functions. This provides the user with a vendor representative with whom to discuss ideas and problems and has had a positive affect on sales opportunities, the report said.

Input recommends that small systems vendors use their field-service organizations to provide satisfactory after-sales support. Users were found to be generally favorable to dealing with field engineering, although the report noted there was "significant" user resistance to field engineers who sell both supplies and software packages.

Another criticism was directed at documentation efforts, which the report said ordinarily receive the lowest priority and are often started late in product development. The result was found to be low-quality documents, usually delivered late.

The report concluded that as the industry grows and new technologies evolve, system maintenance and account responsibilities will become even more important.

The report costs \$2,000 from Input, 1943 Landings Drive, Mountain View, Calif. 94043.

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Dun & Bradstreet Micro Based on IBM XT

WILTON, Conn. — Dun & Bradstreet Corp. has announced the Dunsplus, an IBM Personal Computer XT-based microcomputer, which is equipped with a variety of software products.

Operating as a value-added remarketer of IBM hardware, Dun & Bradstreet is offering Dunsplus with 256K bytes of random-access memory, expandable to 640K bytes. In addition, 40K bytes of permanent read-only memory (ROM) are included. The ROM contains the Basic language, the vendor said.

The system includes one 5¼-in. 10M-byte fixed disk drive; an Intel Corp. 16-bit 8088 microprocessor; three expansion slots; a built-in asyn-

chronous adapter; and a 300- to 1,200 bit/sec modem. The system is also reportedly equipped with an 83-key keyboard and a 6-ft extension cable.

Dunsplus comes equipped with several commercially available programs, including Lotus Development Corp.'s 1-2-3 spreadsheet package and Softword Systems, Inc.'s Multimate word processing software. The system also contains proprietary software that provides a series of menus and preformatted screens which reportedly make the system easier to use.

In addition, Dun & Bradstreet has included a proprietary electronic mail package, a file maintenance

package and the capability for users to customize their own systems by adding either purchased or specially developed software. Users of the system can integrate data obtained from other software packages or from a variety of subscription-based network services, the vendor said.

The Dunsplus system can communicate with IBM mainframes in one of three emulation modes. The unit can emulate an IBM 3270 terminal, an IBM 3101 terminal or a Binary Synchronous Communications terminal under IBM's Systems Network Architecture/Synchronous Data Link Control. In addition, the Dunsplus can act as a remote job entry ter-

terminal for an IBM mainframe, a spokesman said.

Like the Personal Computer XT, the Dunsplus system uses IBM's PC-DOS Release 2.0 operating system. Furthermore, all programs written for the XT will run on the Dunsplus system, the vendor said.

Included in the \$10,200 purchase price of the Dunsplus is a two-day training course. The course was developed for Dun & Bradstreet by National Trading Systems of Los Angeles.

The Dunsplus system will be available in the first quarter of 1984, Dun & Bradstreet said from 187 Danbury Road, Wilton, Conn. 06897.

Micros or CRTs: Which Is Best For Business?

(Continued from Page 83)

Certainly, there were the "beard and sneakers boys," as the programming staff has been referred to by more than one user, but the majority of businessmen were not even aware of the existence of micros. Businessmen who were using data processing equipment were invariably using CRT terminals tied to large, expensive, difficult-to-use mainframe computers.

It is possible to claim that micros did not become popular until the introduction of Visicorp's Visicalc. This spreadsheet application made micros appealing to businessmen who formerly had to act out "what if" scenarios with paper, pencil, eraser, typewriter and copying machine.

The practical necessity before Visicalc was to try to get a projection right the first time, whether you were doing a financial forecast, a budget, a salary projection and so on. In the past, it was a terrible inconvenience to redo any analysis that required a spreadsheet. The post-Visicalc spreadsheet software has removed that inconvenience. Businessmen can afford to be creative, to plan and to schedule resources because of the development and effectiveness of these new tools.

Good software tools for spreadsheets and word processing are also comparatively new. Some of the micro hardware and software products are just entering the second generation. In contrast, mainframe hardware is already in the fourth generation.

The desirable trend is definitely toward integrated software to complement the integrated hardware mentioned previously. Integration of software means that users are able to perform a business function and convert the data resulting from that function to be the input for yet another function. All this can be done in a relatively easy manner. An example is the conversion of a sales forecast into a bar chart or the insertion of an income statement from a spreadsheet into a business proposal.

Butler is an account manager at Duquesne Systems, Inc. in Pittsburgh, Pa.

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Tempest Version of Wang Micro Introduced

LOWELL, Mass. — Wang Laboratories, Inc. has introduced Tempest, a version of the Wang Professional Computer.

The 75PC-T Professional Computer can be used both as a stand-alone microcomputer and as a workstation on Wang's Tempest-accredited 7500T series of multiuser Office Information Systems and Alliance Systems.

According to the vendor, the Tempest expands the scope of protected information processing by providing integrated office automation functions with system security. The unit was designed to meet computing requirements while ensuring system security, the vendor said.

Based on the 16-bit Intel Corp. 8086 microprocessor, the Tempest in-

cludes a low-profile, detachable keyboard; a monochrome display monitor; and an electronics unit.

Primary features include Microsoft, Inc.'s MS-DOS operating system; a CPU with eight expansion slots for option cards; a 5¼-in. dual-sided, double-density diskette drive capable of storing 360K bytes of data; RS-232/MIL-STD-188C- and MIL-188-114-compatible asynchronous serial interface ports; a character-resolution card; direct memory access; a programmable system clock; a detachable, 101-key keyboard with 16 programmable function keys, numeric keypad, cursor control keys and a Help key; Interpretive Basic; and two self-diagnostic testing systems, according to the vendor.

Options include memory expansion cards; dual 360K-byte diskette drives; a graphics-display card; a local communications option; a monitor arm; Basic, Cobol, Fortran and Pascal compilers; and UCSD P-system, VT-100 and CP/M 80 emulation capabilities.

The emulation options also allow the system to collect and transfer data through an asynchronous communications option that provides the teletypewriter protocol. The 75PC-T can emulate a standard teletypewriter or other teletype asynchronous devices to communicate interactively with a variety of systems and to retrieve data from host systems and information systems.

The Tempest supports the same

software packages available with the Wang Professional Computer, including Wang Professional Computer Word Processing, Professional Computer Multiplan, Level II Cobol, Professional Computer Graphics, Notebook and Data Base and a variety of personal computer software.

The diskette drives can also read single-sided, double-density diskettes formatted using MS-DOS and 5¼-in. diskettes formatted using IBM's PC-DOS.

The Tempest supports non-Wang printers through the use of generic printer device drivers. To preserve system integrity, Wang is recommending the use of Tempest-accredited output devices listed on the federal government's preferred products list.

The Tempest is offered in two configurations to meet specific user requirements. The 75PC-01T model includes a single 5¼-in., double-sided, dual density diskette drive capable of storing 360K bytes of data, while the 75PC-02T is equipped with dual 360K-byte diskette drives.

Both models will be available in April. The Wang 75PC-01T Professional Computer is priced at \$4,900; the 75PC-02T is \$5,585. Wang is located at One Industrial Ave., Lowell, Mass. 01851.

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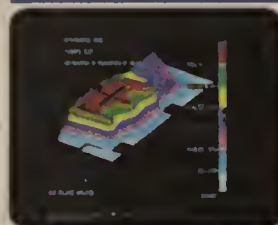
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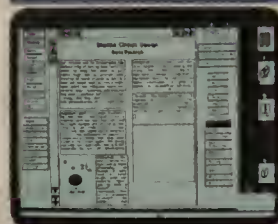
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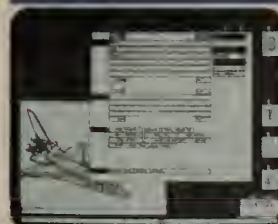
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They do Electronic Mail, Filing and Calendar Management.

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*VAX is a trademark of Digital Equipment Corporation.

SD Processor Announced For IEEE Bus

DALLAS — SD Systems, Inc. has introduced the SBC-300 single-board processor for the IEEE 696 (S-100) bus.

The SBC-300 is a self-contained microcomputer system designed around the Zilog, Inc. Z80 family of microprocessors. Control, CPU, memory and I/O facilities are contained on a single circuit board complying with the IEEE 696 standard.

According to the vendor, the SBC-300 is able to perform as either the IEEE 696 permanent bus master or as one of the slave processors on the bus to support multiuser, multiprocessor applications.

The SBC-300 is available in two versions, a 4 MHz version utilizing the Zilog Z80A CPU and a 6 MHz version employing Zilog's Z80B CPU. The system supplies 64K bytes of on-board, dual-ported, parity-checked memory, the vendor said.

I/O functions include two full-duplex serial ports and a port with an 8-bit bidirectional data bus that may be user-configured to drive printers, Winchester drives or streaming tape drives. All I/O drivers are on board, eliminating the need to purchase additional I/O personality boards, the vendor said.

Additional features include three 16-bit counter/timers, 2K- to 16K-byte-wide programmable read-only memory chips and software-programmable communications options, according to the vendor.

The SBC-300 is offered at a retail price of \$741 for the 4 MHz version and \$825 for the 6 MHz version. SD Systems can be reached through P.O. Box 28810, Dallas, Texas 75228.

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Micro Users Get Pen Plotter

SAN DIEGO — Enter Computer, Inc. has announced the Sweet-P Model 600, a six-pen plotter for users of Apple Computer, Inc., IBM and other microcomputers capable of running Digital Research, Inc.'s CP/M operating system.

Standard features of the Sweet-P Model 600 include a plotting speed of 14 in./sec, both RS-232 and parallel interfaces, 19 English and foreign language character sets and 2K bytes of buffer memory, the vendor said.

The unit was designed to operate with the firm's Sweet-P graphics language or Hewlett-Packard Co.'s Graphics Language, according to the vendor.

Users have a choice of 12 different

pen colors, which can write on paper or acetate. The plotter can also use rapidograph-type drafting pens used in computer-aided design applications, the vendor said.

The plotter costs \$1,095, Enter Computer said from 6867 Nancy Ridge Drive, San Diego, Calif. 92121.

Storage Unit Out for IBM Micro

MOUNTAIN VIEW, Calif. — Storex Corp. has announced the SX410, a 5¼-in. mass storage subsystem for the IBM Personal Computer.

Incorporating Memorex Corp.'s Minimark rigid disk cartridge, the unit features a formatted storage capacity with 5M bytes of removable and 5M bytes of fixed media storage, the vendor said.

Streaming Tape Drive Fits CDC's FSD Disk Drive

DUARTE, Calif. — Megatape Corp. has announced the MT-1220, a half-wide 330M-byte streaming tape drive with an 8.5 in. by 10.2-in. panel footprint compatible with Control

Data Corp.'s 9715 FSD disk drive.

The MT-1220 has a book-size data cartridge and operates in a 50 or 200 in./sec. streaming mode or a 50 in./sec. start-stop mode. Operating at 200 in./sec., the unit is capable of backing up a 300M-byte disk in 24 minutes, according to the vendor.

A 24-track, bit-serial, serpentine format is employed in the drive along with a packing density of 9,600 bit/in.

The unit costs \$4,950 for the drive and \$100 per cartridge.

Further information is available from Megatape through P.O. Box 317, 1041 Hamilton Road, Duarte, Calif. 91010.

Dylon Unveils Tape Drive Line For HP Users

SAN DIEGO — Dylon, Inc. has introduced the Series Seven line of tape drives for data collection, storage, archiving, information interchange and laser disk back-up applications.

The units use group-code-recording method to provide up to 180M bytes of data on a single 2,400-ft reel of standard ½-in. tape.

The 6250 char./in. data density also improves data transfer rates to and from the tape system, according to the vendor.

Series Seven systems are intended for use with Hewlett-Packard Co. processors and are compatible with most HP 1000, HP 3000 and HP 9000 systems.

Operation through a standard HPIB interface allows compatibility with existing system hardware and software.

According to the vendor, the Series Seven costs approximately \$28,000.

Distributor and volume discounts are available.

Dylon is located at 29561 Ridgeway Court, San Diego, Calif. 92123.

Conditioner Provides Power During Outage

SAN DIEGO — Exlin Power Conditioning Co. has developed a line conditioner said to provide protection from power line disturbances.

The Model EX 500P uses a ferroresonant regulator design to provide line isolation, regulation and noise suppression in a portable enclosure suitable for the office environment. It maintains essentially constant output voltage when input line voltage varies, the vendor said.

Operable output levels are provided even when power line voltage falls to brownout levels. Also, short circuit fault currents are limited to 200% of rated output with no damage. Recovery is immediate upon removal of the short, the vendor said.

The EX 500P costs \$375. Exlin can be reached at 4888 Ronson Court, P.O. Box 17841, San Diego, Calif. 92117.

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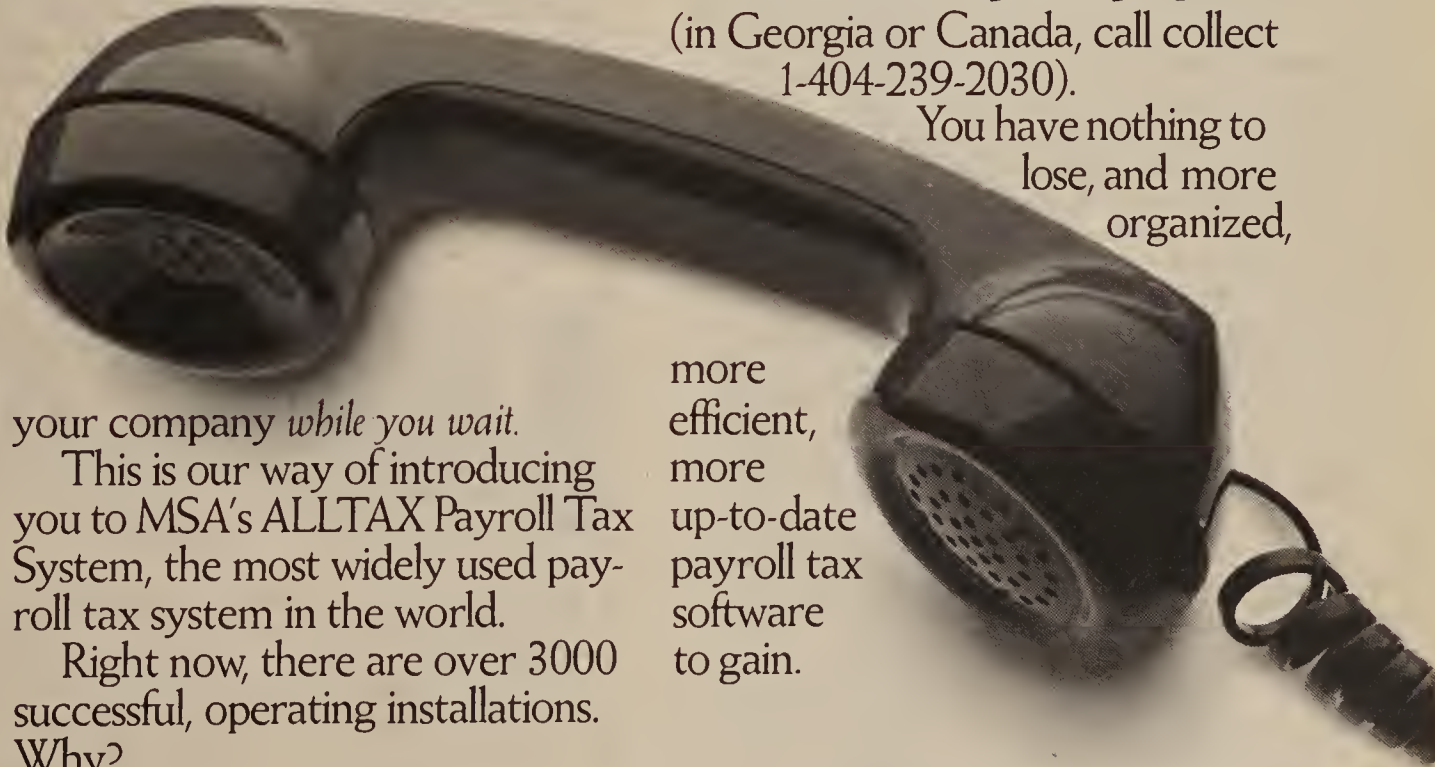
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more efficient, more up-to-date payroll tax software to gain.



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Management Science America, Inc.

UCP Extends Line Modules With USM-1 Synthesizer

IRVINE, Calif. — Universal Computer Products (UCP) has added a speech and sound synthesizer to its line modules compatible with the IBM Personal Computer and Personal Computer XT expansion boards.

The USM-1 Universal Speech and Sound Synthesizer is said to provide the IBM microcomputers with speech, music and I/O capability. The system includes two parallel ports, an IBM-compatible game port and a clock calendar.

The software package provided is a menu-driven interactive program controlling speech and music synthesis.

The synthesizer is list-priced at

\$445 from Universal Computer Products, located at 17482 Jordan St., Irvine, Calif. 92715.

UPS Unveiled for Small Systems

SAN DIEGO — Topaz, Inc. has announced the availability of the Source 2 Uninterruptible Power Supply (UPS) for protecting word processors, point-of-sale terminals and other small, computer-based equipment against power outages.

The systems are said to provide up to 60 minutes of steady ac power to enable critical equipment to continue to operate even during blackouts. Output is a sine wave that matches

Streaming Tape Drive Offers Varied Tape Reel Capabilities

CERRITOS, Calif. — Rosscomp Corp. has announced the D5160, a ½-in. streaming-tape drive that offers

40M-, 80M- or 160M-byte tape reels operating in a 5.25-in. package.

Designed to provide backup for Winchester disk drives, file restructuring, on-line memory expansion, data exchange, data security and archival storage, the D5160 supports the basic ¼-in. tape drive and QIC-02 and Sasi interface standards. A 9-track interface board is also available, making the product plug-compatible with Pertec Computer Corp.'s 9-track devices, the vendor said.

The D5160 supports either 90- or 130-in./sec tape speeds, allowing transfer rates of 90- or 130K byte/sec, respectively.

In addition, the tape drive can be configured with one of three single board subsystem controllers which facilitate communications between a host processor with a Sasi interface and disk drives with either the Q2000, SA1000 or SMD interfaces, Rosscomp said.

Other standard features include self-threading, environmentally self-protecting 4-in. reels; a two-channel read/write head; 24-track, serpentine track format; 8,000 bit/in. recording density; and streaming, NRZI or group-code recording-method support, the vendor said.

Single-quantity price for the D5160 tape drive is \$995 with OEM discounts available. Rosscomp is located at 16643 Valley View Ave., Cerritos, Calif. 90701.

Firm Targets Disk Drive At IBM Micros

PRINCETON, N.J. — Floppy Disk Services, Inc. recently announced an 8-in., double-sided disk drive that reportedly provides 2.5M bytes of on-line memory to users of IBM's Personal Computers.

The FD-PC8 is available in single- and dual-disk configurations and is designed to be visually compatible with IBM's Personal Computers.

The drives are half-height and use a motor that runs only when selected, according to a company spokesman.

The drives cost \$1,495 for dual-disk configuration and \$1,095 for a single configuration. Both units require a controller card.

Floppy Disk Services is located at 741 Alexander Road, Princeton, N.J. 08540.

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Index	Heading	# Entries
CW	Local Area Nets	70
CW	Microcomputers	81
CW	Graphics Systems	136
CW	Accounting Systems	101
CW	Disk Equipment	126
ISO	Dealers/Distributors	64
ISO	IBM-PC	84
ISO	Floppy Disks	51
ISO	Modems	45
ISO	Retail Stores	53

And that's a sample of just this year. We also have Indexes for Computerworld that go all the way back to 1976 and Indexes for CBN back to the first — (Nov. 1978-Dec. 1979)

If you don't have all the back issues of Computerworld and ISO WORLD that you need to get the articles you want, you can order back copies for the entire year on 35mm microfilm from University Microfilm, Int., Periodical Entry Dept., 300 North Zeeb Road, Ann Arbor, MI 48106 — at very reasonable rates. Or you can simply take advantage of their reprint service for individual articles.

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Designed to give you a valuable, one-stop information source for communications vendors and products, this *Buyer's Guide* includes all the tools you need to make the right communications choice:

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COMPUTERWORLD

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Single-Board Processor Out From SDSystems for S-100

DALLAS — SDSystems, Inc. has announced the SBC-300 single-board processor for the IEEE-696 (S-100) bus.

It is said to be a high-performance, self-contained microcomputer system designed around the Zilog, Inc. Z80 family of microcomputers. Control, CPU, memory and extensive I/O facilities are all contained on a single circuit board that fully complies with the IEEE-696 standard, the vendor said. The SBC-300 is able to perform as either the IEEE-696 permanent bus master or as one of the slave processors on the bus to support multiuser, multiprocessor applications.

It is available in two versions: a 4-

MHz version utilizing the Z80A CPU and a 6-MHz model employing the Z80B CPU. Also, 64K bytes of on-board, dual-ported, parity-checked memory is supplied, the vendor added. I/O functions include two full-duplex serial ports and a Shugart Associates, Inc. Standard Interface port with an 8-bit bidirectional data bus that may be user-configured to drive printers, Winchester drives or streaming tape drives.

It is offered at a suggested retail price of \$741 for the 4-MHz version and \$825 for the 6-MHz model. More information is available from SDSystems through P.O. Box 28810, Dallas, Texas 75228.

Smart Digital Plotter Offered

EVERETT, Wash. — The John Fluke Manufacturing Co. has introduced the 1771A Intelligent Digital Plotter designed for use with the Fluke 1720A and 1722A Instrument Controllers. The unit includes an applications software package programmed in Basic.

The product allows the user to plot interactive line graphs, bar graphs, histograms, pie charts and labels. The applications software contains an Automatic Plotter Driver that can be called by the user's program to plot and format data collected by the user's specific applications software, the vendor said.

The product also plots text via the Controller System Text Editor. Line patterns and point symbols can be varied, and pen color may be

changed by the operator, according to the vendor.

The unit costs \$1,995, John Fluke Manufacturing said, through P.O. Box C9090, Everett, Wash. 98206.

Disk Controller Said to Handle Four Drives

SAN DIEGO — Axis, Inc. recently announced a single-board floppy disk controller capable of simultaneously controlling up to four drives in various size and format combinations.

The LSB-7810 reportedly features programmable drive formats and motor control; single-sector, multiple-sector and multiple-track transfers; optional on-board direct-memory access controller; and jumper-selectable interrupts.

A company spokesman said the device simultaneously controls four disk drives in any size combination of 8-in., 5¼-in. and 3½-in. drives and any format combination of size, density and track. The optional DMA Controller reportedly will free up the host processor during disk transfers and provide full-vectored interrupt capability.

The controller costs \$280 in single quantities, and the DMA option is priced at \$35, according to the vendor. Axis is located at Suite 208, 7825 Engineer Road, San Diego, Calif. 92111.

Printer Interface From Microbits Out for Atari

ALBANY, Ore. — Microbits Peripheral Products (MPP) has announced a peripheral attachment for Atari Corp. computers.

The MPP-1150 Printer Interface reportedly works on all Atari computers and replaces the Atari 850 Interface Module. It connects to the serial bus on the computer and daisy chains with other Atari peripherals. The interface includes a 3-ft cable with Centronics, Inc.'s plug and carries a two-year warranty; the vendor said.

The MPP-1150 Printer Interface costs \$99.95. Microbits Peripherals Products is located at 225 W. Third St., Albany, Ore. 97321.



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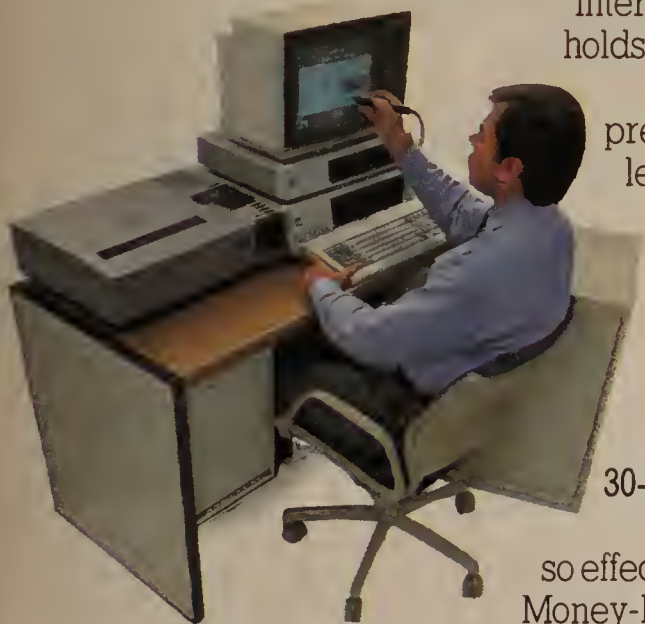
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Tape Drive Formatter Offers IBM Compatibility

HALESITE, N.Y. — The TDX Peripherals Division of Telebyte Technology, Inc. has announced a formatter for IBM-compatible, ½-in. magnetic tape drives.

Using a Signetics Corp. microprocessor and associated integrated circuits, the formatter provides Ansi-compatible operation for generation or reproduction of magnetic tapes.

The formatter has the capability of controlling up to eight tape drives in a daisy chain configuration, the vendor said.

The formatter is packaged on a single, 10½- by 15½-in. printed-circuit board, the

vendor said.

The formatters cost \$1,600 each. When coupled with the company's 75 in./sec tape drive, TDX 75 and RS-232 interface, the system sells for \$8,400, according to the vendor.

Further information is available from TDX Peripherals Division, Telebyte Technology, 148 New York Ave., Halesite, N.Y. 11743.

National Semi Rolls Out 32-Bit Chip

SANTA CLARA, Calif. — National Semiconductor Corp. has announced the NS32032, a 32-bit monolithic microprocessor.

The NS32032 was designed for various applications including computer-aided design and manufacturing, graphics and industrial process control, the vendor said.

Currently, the NS32032 is available for \$200 apiece in sample quantities of 100 or more, according to the vendor.

By 1985, the firm said, the units will cost between \$20 and \$60 each.

National Semiconductor is located at 2900 Semiconductor Drive, Santa Clara, Calif. 95051.

Timex Micros Get Devices For Home Use

BOSTON — Intercomputer, Inc. recently announced two devices designed to provide home-use applications for Timex Computer Corp.'s Timex/Sinclair microcomputers.

According to the company, Intercontroller is programmed with Basic commands to control four standard socket outlets into which home electrical devices may be plugged.

Softbox is a multiuse expansion port providing four software-selectable slots to be used with program cartridges and Intercontrollers.

The Intercontroller is priced at \$99.95, and Softbox is priced at \$59.95. Intercomputer is located at 358 Chestnut Hill Ave., Boston, Mass. 02146.

Adds Winchester Backup Storage

Subsystem Unveiled for LSI-11

ANAHEIM, Calif. — Computer Storage Technology, Inc. recently announced a streaming-tape subsystem that provides users of Digital Equipment Corp.'s LSI-11 processors with up to 55M bytes of backup storage for large capacity Winchester disk drives.

The CS-300 is comprised of a single-board peripheral processor occupying one slot

in the LSI-11 chassis or I/O expansion cabinet and a ¼-in. cartridge tape streamer, along with a ¼-in. tape cartridge.

The unit can be configured in two models, the 20M-byte CS-320 and the 45M-byte CS-345, the vendor said.

The latter unit can be expanded to 55M bytes.

Data transfer rates in both

configurations may be sustained at 90K byte/sec, with tape utilization of approximately 97%, according to a company spokesman.

Price for a single subsystem is \$4,970, and delivery is 60 days after receipt of order, the vendor said.

Computer Storage Technology is located at 1369 S. State College Blvd., Anaheim, Calif. 92806.

MEMOREX D HIGH-PERFORMANCE TO T

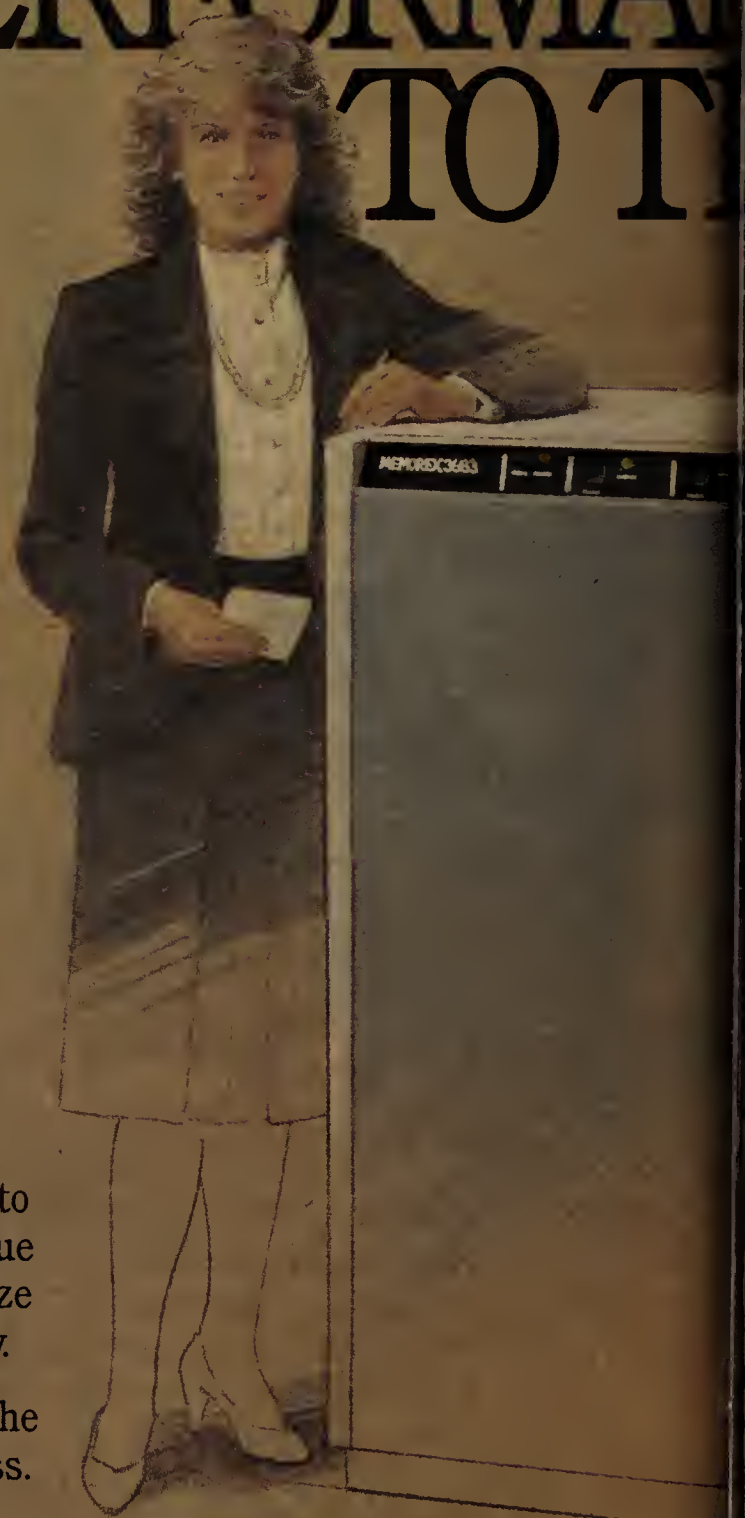
Performance that can improve throughput by a full 20 percent, that's the new Memorex 3680 Disk Drive Subsystem... Performance that can mean faster response for your terminal user and a lot less time required to run jobs.

Or to look at it another way, it can mean getting a lot more jobs done in the same amount of time.

This impressive achievement is the result of an advanced protocol scheme in combination with the 3680's new MAPS feature (Maximum Availability Path Selection) which permits *simultaneous* input and output to any two actuators on a string.

What's more, the 3680 is designed to be as reliable as it is fast, with unique new features designed to maximize system availability.

Obviously, in 3380 class subsystems, the 3680 just went to the head of the class.



Memorex Corporation, Storage Equipment Marketing, San Tomas at Central Expressway, Santa Clara, California 95052. Telephone: (408) 987-2800. © Copyright Memorex Corporation, 1983.

Board Ties Drives to Apple Micros

BROWNSBORO, Ala. — Data-Cue, Inc. has unveiled a disk controller board said to allow users to connect two 8-in. or two 3½-in. double-density disk drives to the Apple Computer, Inc. Apple II and compatible microcomputers.

Using Diskmaster II, the Apple II reportedly will support single- and double-sided 8-in. drives

such as the Shugart Associates, Inc. 801/851 series. It also supports Shugart-compatible drives.

The board contains integrated read-only and random-access memory and standard utilities. Among these utilities is a Filer, which can be used to transfer files from drive to drive, the vendor said.

The unit includes software drivers to run under

DOS 3.3, Pascal 1.1 and Microsoft, Inc.'s Microsoft CP/M. The Diskmaster II will also read and write standard Digital Research, Inc. CP/M and 3740-compatible disks.

Also included in the package are installation and integration instructions. The unit costs \$265 from Data-Cue, 5696 Highway, 431 South, Brownsboro, Ala. 35741.

Starflow Announces Drafting System Based on PDP-11

CINCINNATI — Starflow Engineering, Inc. has announced the System Type 2, a computer-aided drafting system.

Based on Digital Equipment Corp.'s PDP-11 mini-computer, the System Type 2 offers 256K bytes of main

memory and dual floppy double-density disk drives. A 10M-byte hard disk drive is also included. The system uses the firm's real-time operating system, according to the vendor.

The System Type 2 offers four I/O ports and four user terminals. The applications software is included, and the unit can be programmed in Basic, Fortran, Pascal or assembler languages, the vendor said.

Each intelligent color terminal has a 13-in. screen and offers eight colors from a palette of 64. The workstations have detached keyboards with numeric pads, the vendor said.

Included with the system is a six-pen plotter that offers multiple line widths and colors.

The System Type 2 costs \$40,000. Additional information is available from Starflow Engineering at 4740A Interstate Drive, Cincinnati, Ohio 45246.

System/38 Gets Service From MAI

FRAZER, Pa. — The Sorbus Service Division of Management Assistance, Inc. (MAI) has introduced remedial and preventive maintenance service for the IBM System/38 and compatible peripherals.

The service offers System/38 users 24-hour, seven-day-a-week servicing and mixed-vendor problem determination, Sorbus said.

Service fees range from approximately \$300 to \$700 per month.

Further information is available from Sorbus Service Division/MAI, 50 E. Swedesford Road, Frazer, Pa. 19355.

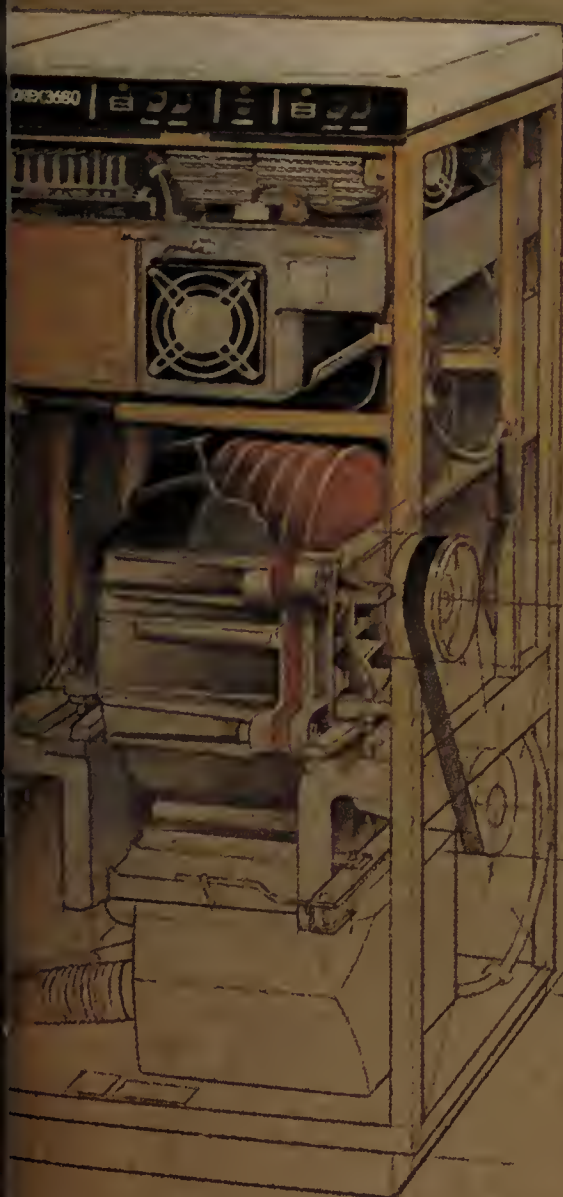
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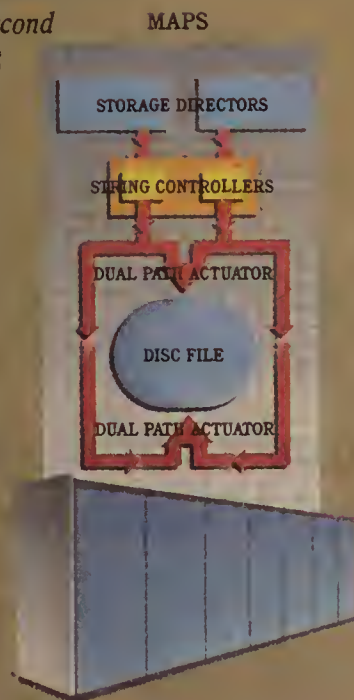
State-of-the-art circuitry and microprocessor based architecture permit maintenance down to the actuator level.

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Each spindle is provided with its own power supply and air filtration system.

HDA is located below heat-generating power supply.



MEMOREX
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SMD Disk Controllers Unveiled for DEC Minis

ORANGE, Calif. — MDB Systems, Inc. has introduced two quad-size, storage modular device (SMD) disk controllers for Digital Equipment Corp. PDP-11 Unibus and VAX-11 computers.

Each disk controller is said to be a quad-size board that interfaces two physical disk drives (up to four logical units) to the PDP-11 Unibus. One controller, designated MDB-RM11-Q (quad-size),

reportedly emulates DEC's RM02, RM03 and RM05, and the second controller, designated MDB-RK11-Q, emulates RK06 and RK07 disk drives. Either controller can simultaneously mix emulation modes within the same family, the vendor said.

Completely software-transparent to all DEC operating systems, plus Unix and TSX (no patches required), the controllers reportedly of-

fer capability up to 56M bytes (RK11) or 512M bytes (RM11) per formatted device. Also, the controllers have a true SMD interface using standard SMD drivers and receivers, thereby allowing placement of disk drives up to 50 feet from the computer.

In addition, the controllers incorporate true DEC 32-bit Error Correction Codes, Header Error Control and media-defect flagging to al-

low interchangeability of disk packs between DEC RM drives and add-on drives. A multiple-sector, bipolar, random-access memory buffer reportedly eliminates "date late" errors. A direct-memory-access automatic throttle permits user selection of data transfer bursts from one to 16 words, the vendor said.

The 2091 bit-slice, microprocessor-controlled module is said to support dual disk

access capability and overlapped searches.

The controllers are priced at \$3,200 for the MDB-RM11 and \$2,800 for the MDB-RK11. MDB Systems is located at 1995 N. Batavia St., Orange, Calif. 92665.

Micro Fits Peripherals From Others

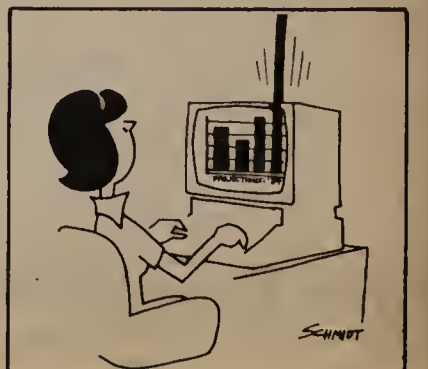
SAN JOSE, Calif. — Onyx Systems, Inc. has announced an Intel Corp. 80186-based, multiuser, 16-bit microcomputer said to support peripherals from other manufacturers.

The Onyx 186 series initially will be available with Digital Research, Inc.'s Concurrent CP/M 86; Phase One Systems, Inc.'s Oasis-16; or Science Management Corp.'s Thoroughbred/OS for multiple users, and Microsoft, Inc.'s MS-DOS for a single user. It reportedly has six serial ports for any combination of terminals, printers or modems; one parallel printer port; and two ports for disk and tape expansion.

A basic configuration includes an ergonomically designed desktop unit with a display terminal, a 256K-byte random-access memory (RAM) and a 1M-byte, 5¼-in. floppy disk drive. The system can be expanded to include up to 512K bytes of RAM, the vendor said. Also, an expansion cabinet can be fully integrated into the system to house an add-on Winchester and ¼-in. tape cartridge for backup.

The video display terminal included with the system is also a new product developed by Onyx. The Onyx terminal features a 14-in., non-glare blue or green phosphor screen; tilt-and-swivel monitor; a detachable keyboard with 104 sculptured keys, numeric keypad and cursor-control keypad; 28 function keys; and a 256 Ascii character set with business graphics, the vendor said.

It is available for delivery in March and has a suggested retail price beginning at \$4,495 for a complete desktop workstation. Onyx Systems is located at 25 E. Trimble Road, San Jose, Calif. 95131.



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also available as part of the 32-device complement.

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OA Package Out For 16-Bit Micros Running Unix

SAN JOSE, Calif. — Onyx Systems, Inc. recently announced an office automation integrated software package for 16-bit microcomputers running under the Unix operating system.

The package, Onyx Office, combines word processing, electronic spreadsheet and relational data base management. Available as options are a development system and an electronic mail package. All applications are reportedly tied together under a runtime menu system.

The package will be available in December and will be bundled free with all Onyx Systems' Unix-based microcomputers. Current users of Onyx systems will be able to purchase the package for a suggested retail price of \$4,995. Onyx Systems is located at 25 E. Trimble Road, San Jose, Calif. 95131.

AV Instruction Set Bows for WP Users

ATLANTA — R. Lawrence Ltd. has announced audiovisual instructional modules for IBM's Displaywriter, Wang Laboratories, Inc.'s QIS/WPS/VS and Xerox Corp.'s 860 word processing systems.

The modules consist of an audiovisual presentation (slides and cassette tapes compatible with widely available projector/player units) and learner's manual. Each presentation requires 10 to 15 minutes of training time, according to the vendor.

Weekly rental fees are \$300, and the purchase price is \$1,800. Further information is available from R. Lawrence, 6065 Roswell Road N.E., Atlanta, Ga. 30328.

AMT Desktop Dot Matrix Printer Boasts Daisywheel Print Quality

NEWBURY PARK, Calif. — Advanced Matrix Technology, Inc. (AMT) has introduced a desktop dot matrix printer designed to eliminate the need for hard-copy output devices for the word processing, spreadsheet, graphics, general accounting and overhead transparency generated in the automated office.

The AMT Office Printer offers business users the print quality and flexible paper-handling capabilities of a daisywheel printer, with the speed, multiple-font support and reliable performance characteristics of a dot matrix device, a vendor

Growing Relevance Found For Office Systems in MIS

FRAMINGHAM, Mass. — As management information systems (MIS) managers continue to distribute processing power to the end user, the issue of office automation becomes more relevant.

This according to a study conducted here recently by the International Data Corp. (IDC). Titled "Office Automation Software in Large Systems Environments," it evaluated the "size, growth and opportunities available to vendors serving markets that have opened up due to challenges posed to the industry by end-user computing."

By the end of 1987, the study estimates, there will be 26,000 multifunction systems (which provide more than just word processing) installed across the U.S., representing an increase of 106% compounded annually over the next five years.

According to the study, there were more than 200,000 users of computer-based message systems (CBMS) in 1982, and by 1987, that number should reach over three million.

"Office automation continues to develop away from the enhancement of discrete tasks like text preparation and toward providing integrated information processing systems for the full range of office activities," the study noted.

Multifunction Systems

"The term multifunction is being used to describe more and more office systems. User demand for easy-to-use systems that offer word and data processing and are linked together in an integrated communications network have galvanized a number of vendors who seek a foothold in the unfolding market for office automation," it said.

spokesman said.

The printer can also support multiple fonts, which can instantly be changed from one to another or from alphanumeric to graphics. Using the optional multi-color ribbon cartridge, business documents such as spreadsheets can be illustrated with high-resolution color graphics images. The printer also produces overhead transparencies.

Priced at \$3,195, the printer is available immediately. Advanced Matrix Technology is located at 1157 Tourmaline Drive, Newbury Park, Calif. 91320.

'Office automation continues to develop away from the enhancement of discrete tasks like text preparation and toward providing integrated information processing systems for the full range of office activities.' — International Data Corp. study.

According to the study, few of the word processors installed to date support features that are "genuinely multifunctional," although the study expects that by 1987, some 80% of the installed base will be capable of performing tasks such as electronic mail, records management spreadsheet analysis and graphics, all of which are generally held to be multifunctional.

According to the study, the integration of word and data processing is being driven by the following major forces and potential benefits:

- A dramatic price decline in equipment and technology.
- The proliferation of intelligent microcomputers throughout the business organization.
- The availability and integration of new software programs that make it easier to attract and train end users while reducing maintenance and upgrading costs.
- The increased importance of data base access.

As for the integration of CBMS capabilities into multifunction systems, the IDC study suggests that these systems are "just one of the many technologies that fall into a broad-based category that we call electronic mail."

Messaging Services Growing

According to the study, a growing number of vendors are providing large-scale messaging services to large companies. These include time-sharing companies, service bureaus and specialized common carriers that offer CBMS services as a part of a large product mix: MCI Communications Corp., Satellite Business Systems, value-added networks such as Tymnet and Telenet and telephone companies.

Of 197 users surveyed in the IDC study, 40% of the respondents indicated that they used CBMS. Of paramount concern to CBMS users was the price of a messaging package, followed closely by training requirements.

The study costs \$3,000 from IDC at 5 Speen St., Framingham, Mass. 01701.

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PRODUCT SPECIFICATION	
<p>Terminal Type Will replace DEC VT 100, VT 101, VT 102 & VT 131</p> <p>Ergonomic Characteristics Tilt, Swivel Detached low profile (DIN) keyboard High contrast green phosphor Non-reflective surfaces Non-volatile set-up</p> <p>Display High resolution 14" CRT standard 24 x 80 or 132 column/format Viewing area - (14 inch monitor) 9.09" (23.0 cm) wide by 6.8" (16.3 cm) high Character size - 80 column - .086" (2.24 mm) wide by .204" (5.18 mm) high 132 column - .048" (1.25 mm) wide by .204" (5.18 mm) high 126 unique symbols - 94 alpha-numeric, 32 graphics symbols 7 x 10 matrix with 2 lower case descenders in a 9 x 12 window Selectable 132 column x 24 line display mode with 5 x 9 character dot matrix Attributes - high/low intensity, blink, reverse video and underline at every display position Programmable, double width character line or double width/height character line Smooth scroll Line drawing graphics Cursor, selectable as box or blinking underline</p> <p>Monitor Performance Green phosphor - 14 inch (35.6 cm) diagonal $\pm 1\%$ geometry Dot frequency, 22MHz 19.5 KHz horizontal frequency 50/60 Hz non-interlaced refresh</p> <p>Keyboard Low profile to European standard 83 Key detached keyboard including sculptured typewriter layout and 14 key numeric pad including period, comma, minus and enter Typematic Four function keys Audible keyclick (operator selectable) Seven visual indicators Editing function - Tab, insert line, delete line, insert character, delete character, clear, home and back tab Upper/lower case with all caps light Local print</p>	<p>Communication Interface RS232C/current loop X on, X off protocol (operator selectable) Full duplex compatible with WE modem #103A, 212A Baud rate - selectable 75, 110, 134.5, 150, 300, 600, 1200, 1800, 2000, 2400, 4800, 9600, 19,200 Parity - selectable odd, even, 1 or 0 Word length 7 or 8 bits</p> <p>Auxiliary Interface RS232C compatible Bi-directional Remote control - on line without display, auto print, line print, page print Baud rate - selectable 75, 110, 134.5, 150, 300, 600, 1200, 1800, 2000, 2400, 4800, 9600, 19,200</p> <p>System Oriented Features ANSI Standard X-3.64 Multimode - local, interactive, edit page, line and partial page Self diagnostics Terminal status inquiry Numeric pad alternates as function pad Tabbing by column and by fields Horizontal "split screen" Data compression/separation X on/X off protocol Smooth scroll National character sets (option) Full editing command set with protected fields</p> <p>Physical Characteristics Mechanical Height - 15 inches (38.1 cm) Width - 18 1/2 inches (47.3 cm) Console depth - 15 1/2 in. (40.3 cm) Keyboard depth - 8 1/2 in. (21.6 cm) Weight - 35 lbs. (15.9 kg) Electrical Power consumption - 48 watts Power input selectable - 115 $\pm 10\%$ and 230 $\pm 10\%$ (50 - 60 Hz $\pm 1\%$)</p> <p>Environmental Temperature - 10° C to 40° C Humidity - up to 90% relative non-condensing Shock - 50g in 3 axis (in container) Vibration - 10 to 30 Hz (in container) Specification subject to change without prior notice</p>

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Employee Ingenuity Rewarded With High-Paying Programs



By John Gallant
CW Staff

John H. Patterson probably never imagined that the \$30 he set aside in 1894 to reward employee ingenuity would grow into a multimillion-dollar practice rivaling *The Price is Right* in the amount of cash and prizes awarded each year.

Half a century later in the midst of World War II, Patterson's NCR Corp. — then known as the National Cash Register Co. — celebrated the 50th anniversary of its employee suggestion award program by handing out thousands of dollars in war bonds. The top idea netted the winning mechanical assembler a \$1,500 war bond for his innovative method of cleaning ball bearings.

Today, that \$1,500 prize pales in com-

parison to some of the awards handed out to employees whose suggestions — ranging from the painfully obvious to the technically complex (see related story) — boost productivity and profits for the largest computer manufacturers. IBM has awarded five \$100,000 prizes this year alone, and a fledgling suggestion program at Burroughs Corp. handed out awards for \$100,000 and \$50,000 to winning employees in its first two years.

Overall, IBM's employee suggestion award program, implemented in 1928, gave out more than \$12 million last year to some 30,000 of the company's 365,000 eligible employees, according to an IBM spokesman. But generosity was not the driving force behind the prizes. IBM figures those suggestions saved the compa-

ny nearly \$65 million. IBM awards 25% of the amount an employee's suggestion saves the firm during the first year it is implemented, up to \$100,000.

Burroughs began its employee suggestion award program only two years ago, but the company claims it already rivals IBM's. "It took IBM 40 years to award a \$100,000 prize. We did it in our very first year. This is a damn good program," spokesman James Fitzgerald said. Since the program was implemented in October 1981, Burroughs has traded more than \$430,000 for ideas the company said have netted almost \$3 million in savings.

At Honeywell, Inc.'s manufacturing facilities in Minneapolis, Minn., employees participating in the Error Cause Re-

(Continued on Page 105)

AT&T Official Rails Against Government-Imposed Rules

By Bill Laberis
CW Staff

NEW YORK — With a captive audience of heavy communications users, a ranking AT&T official seized the opportunity to rail against government-imposed regulations, claiming the realities of today's marketplace render the regulatory process "an anachronism."

"The tariff process reveals our market research to our competitors . . . and informs them of our plans before we implement them," said Morris Tanenbaum, chairman of AT&T Communications, the long-distance branch of the divested AT&T. "With price effectively constrained by the marketplace, with the ease of entry that exists, with the financing ability of our competitors, there simply is no justification for unequal regulation of AT&T," he said.

Tanenbaum delivered his remarks at the 15th annual convention and exhibition of the Information Industry Association held here earlier this month. His audience consisted largely of representatives of firms that spend heavily on telecommunications services, such as data base companies, econometric data sellers and investment houses.

Sharing the stage with Robert Casale, marketing head of AT&T's Information Systems, Inc., Tanenbaum called for a phased "elimination of all the direct costs associated with regulation." These regulations, which apply in many cases to AT&T in the provision of communications services but not to its competitors, "significantly reduce the benefits that competition can bring to the marketplace," Tanenbaum said.



CW Photo by B. Laberis

Morris Tanenbaum

The Communications chief said that the regulatory process has forced AT&T to charge rates so high that its competitors "can gain market share at will."

In particular, Tanenbaum referred to the Federal Communications Commission (FCC) regulations requiring AT&T to wade through a lengthy tariff filing procedure when it wishes to adjust its communications charges.

The FCC recently ruled that AT&T's communications competitors, chiefly MCI Communications Corp. and GTE Corp.'s Sprint long-distance service, are not bound to the same rules and procedures when instituting a rate change.

On the other hand, the procedures AT&T must follow can delay a rate hike (or decrease it) by a minimum of 90

Micro Makers Seen Close to Shakeout, But Optimism Grows

By Patricia Keefe
CW Staff

Troubled micro makers such as Fortune Systems Corp., Vector Graphics, Inc. and Victor Technologies, Inc. have been considered shakeout candidates by a number of analysts, and recent announcements have done little to erode that belief. However, all three appear to be taking steps to turn around, and there are signs of growing optimism among analysts about the respective futures of these firms.

Victor recently announced that it will lay off 300 employees and expects to lose "substantially" more money in the third quarter than the \$11.1 million it lost in the second. More losses are forecast for the fourth quarter. This year, Victor's labor force has yo-yoed from 900 to a reported 3,000 and is projected to dip to about 1,000 by December. To date, the firm has idled some 1,650 employees, reducing the work force to 1,300, with cuts spreading to the managerial sector. Victor is \$90 million in debt, \$30 million of which is spread over 1,500 creditors. It has said it is not looking to merge.

Victor is, however, viable in Europe, which accounts for 65% of its sales and where it has been successful at competing against the IBM Personal Computer in several markets, according to Kenneth Bosomworth, president of International Resource Development, Inc. The company has a "decent flow of sales" and "potential" to be a survivor, he added. However, analyst Mike Killen of Strategic, Inc. believes that the European market began to

(Continued on Page 106)

Crowntek to Acquire CCA for \$40 Million

CAMBRIDGE, Mass. — Computer Corp. of America (CCA) last week announced an agreement whereby Crowntek, Inc. of Canada will acquire all outstanding stock of CCA in a deal valued at about \$40 million.

CCA, a data base management software vendor, will retain its present management and head-office staff, according to the preliminary

plan for acquisition. The deal is subject to the approval of Crowntek's board and of the holders of at least 52% of CCA's stock.

CCA is a developer and marketer of IBM mainframe products, the principal of which is the Model 204. The company serves approximately 400 customers. Crowntek is owned by Extencare Ltd. of Toronto.

Motorola Seeks Court Action Against CDI, Former Employees

By Peter Bartolik
CW Staff

CHICAGO — Motorola, Inc. is again seeking legal action against a display terminal company founded by three of its former employees, an action characterized by one of those defendants as an attempt to injure the young company.

Motorola announced re-

'Motorola's litigation was an attempt to harass CDI (Computer Displays International, Inc.) and ... use ... unwarranted court proceedings as a basis for (prompting) adverse publicity to injure CDI.' — Robert G. Gatza, former Motorola employee and president of CDI.

cently that it has asked the U.S. District Court here to hold Computer Displays In-

ternational, Inc. (CDI) and three of its executives in contempt of court for allegedly violating an earlier injunction against the use of Motorola information.

A Motorola spokesman said that under the terms of a settlement agreement, which ended a lawsuit originally filed in March 1982 [CW, April 5, 1982], CDI and former Motorola employees Robert G. Gatza, Chris A. Petri and Thomas S. Fair were permanently enjoined from using Motorola proprietary information that the company claimed CDI was using in its MPG display monitors.

Earlier this year [CW, July 25], U.S. District Judge Susan Getzendanner ruled CDI was violating the earlier injunction in the production and marketing of a monitor that Motorola claimed was "essentially equivalent" to the MPG series. CDI is appealing that finding.

Motorola said it has now asked Judge Getzendanner to order CDI to halt the sale of its recently introduced AD monitor. Motorola's claim in all the court action has been that CDI has used misappropriated confidential information and technology relating to Motorola's DS3000 and DS4000 monitors.

Gatza, president of CDI, left Motorola in February 1981, along with Petri, who is vice-president of CDI. Fair, CDI's director of manufacturing operations, left Motorola in July 1981.

In an interview with *Computerworld*, Gatza said no proprietary or trade-secret information was ever involved in CDI's products, which began shipments in June 1981. Gatza said Motorola admitted "in open court" that its DS series had been shipped "a full year before they allegedly publicly announced that product" in 1981, and that the products had been displayed at the National Computer Conference in 1980.

More significant, according to Gatza, is that "the AD series which we are currently shipping is entirely different [from the DS and MPG products] and warrants no litigation whatsoever."

Gatza said he believed Motorola's litigation was an attempt to harass CDI and said the company is reviewing legal options.

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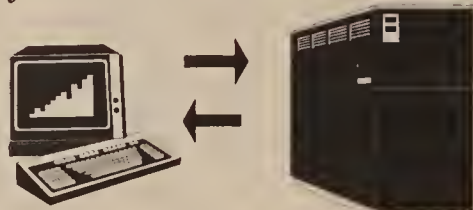
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To Fifth-Generation Orient

Martin: U.S. May Play Second Fiddle

By Bill Laberis
CW Staff

NEW YORK — A quantum leap by the Japanese into the so-called fifth generation of computing could leave the West playing second fiddle to the Orient, industry guru James Martin warned.

Delivering his admonition to a packed house at the 15th annual convention and exhibition of the Information Industry Association earlier this month, Martin argued that "many of us are not looking at the whole spectrum of what's going on. We're not using enough imagination. We're not looking at what the Japanese are doing. We're not synthesizing the latest technological trends.

"We don't want Japan to take our highest revenue industry away from us. Because if we're not careful, the dominant country in the world's largest industry in the 1990s will be Japan."

In a dynamic 90-minute presentation, Martin employed his whirlwind style and wit to guide his audience through the technological past while offering a glimpse of his vision of the future.

The technology that will pave the way into the future is fairly predictable, Martin suggested. The question remains whether the West — largely in the presence of IBM or Japan, as a unified entity — will lead the way.

The "gall" and strategy of the Japanese dictates that its industry-government "partnership takes away as much business from IBM as they possibly can," Martin said.

However, the means for doing so has changed in the last decade. In the 1970s, the Japanese tried to battle IBM on its own turf, building IBM-

AT&T Official Rails Against U.S. Regulations

(Continued from Page 101)
after the request for a rate change is filed, Tanenbaum said.

"AT&T must submit massive amounts of data, while its competitors can change a price with no documentation or notice," he said. "Similar requirements apply when we wish to introduce, change or discontinue any service."

Tanenbaum also railed against the constraints of the Second Computer Inquiry — the binding, federal government document that set forth guidelines for AT&T to operate in unregulated markets, such as computers. These constraints prevent AT&T's unregulated subsidiaries, such as Western Electric, Bell Laboratories and the Information Systems division, from granting AT&T Communications preferential treatment not accorded the company's competitors.

To press his point in Washington, D.C., Tanenbaum assured his audience that AT&T is lobbying heavily to remove the remaining regulations that apply to AT&T but not to its competitors.

compatible mainframes. That strategy succeeded "only up to a point," Martin said.

"So now they're saying, 'Let's invest in a different game which IBM is not playing and make sure that we have absolutely the world's dominant position in that new game,'" Martin maintained.

That new game involves the development of specialized hardware that is a hybrid of today's scientific and commercial processors, machines Martin labeled "inference processors." Development of such machines, capable of both processing information at almost unfathomable speeds and of executing highly so-

phisticated programming, will be spearheaded by advances in semiconductor technology.

The Japanese, Martin noted, have already grabbed the market lead in production of high-reliability memory chips.

Martin offered no quick fix to the Japanese threat, suggesting instead that the West's underlying strength resides with the entrepreneurs who run relatively small businesses, not with the industry giants. The entrepreneurs, he said, "will lead the way," with the larger companies buying the entrepreneurs' innovative technology and using it on the production line.



CW Photo by B. Laberis

James Martin

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to speech in real time. Products in the family include a CallText 5000 module for IBM PC and compatible personal computers, a CallText 5050 RS232 peripheral unit that operates under control of any host computer, and a CallText 5100 multichannel programmable system that operates up to six telephone/voice channels simultaneously.

Each of the CallText products can be programmed to answer the telephone, obtain text data from a host data base, convert the text into speech, and supply the information in voice to users. The products are also designed to initiate calls.

For more information about remote retrieval of text data in voice with CallText products, contact Speech Plus, Inc., 461 North Bernardo Avenue, Mountain View, California 94043. Telephone (415) 964-7023.



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Hitachi Defense Mum on IBM Payment Report

Calling the amount of any payment by Hitachi Ltd. to IBM "confidential," a lawyer in the firm that spearheaded the defense of Hitachi in a conspiracy suit brought by IBM would not comment on a recent report in *The Wall Street Journal* that said a \$300 million payment had been made.

The report stated that the secret payment was made in the settlement of the lawsuit in which IBM charged Hitachi with the theft of trade secrets.

"The story and particularly the amount are highly speculative," a spokesman for IBM added. "We have no further comment."

It was partly in exchange for the payment that IBM dropped the suit, which was described as "painfully embarrassing" to Hitachi.

William Jentes, a partner at Kirkland & Ellis, a Chicago law firm hired by Hitachi, was cited by the paper as confirming that a secret payment had been made under an agreement that also allowed Hitachi

to continue using IBM software it had allegedly stolen.

But when Jentes' office was

reached by telephone, his secretary would only read a prepared statement to reporters.

Altos Shareholder Files Suit

SAN JOSE, Calif. — A shareholder in Altos Computer Systems, Inc. has filed a class action suit in U.S. District Court charging the company and certain officers and directors with violations of security laws.

The complaint alleges there were misstatements or omissions in con-

nections with the company's recent public offering. It also says Altos was experiencing production problems with its Series 586 and ACS 68000.

The suit seeks action on behalf of all persons who purchased Altos common stock during Nov. 4, 1982 and Jan. 20, 1983.

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For Francis Hornby, earning \$5,000 was as easy as removing eight screws and a wall plate.

Hornby, a group leader at Honeywell, Inc.'s Residential Division in Minneapolis, Minn., thought the company might save some money by eliminating the extra hardware — eight screws and a wall plate — that was shipped with each Econostat thermostat. He was right. Honeywell saved more than \$58,000 the first year Hornby's suggestion was implemented and, in return, Hornby was rewarded with \$5,000, the maximum award in Honeywell's Error Cause Removal (ECR) program.

Sound simple? It was. But Milton Pfarr's innovative method of changing print wheels in terminal teller machines was not much more complex, and he earned \$100,000 for the suggestion. According to a Burroughs Corp. spokesman, Pfarr, a senior field service engineer in Clarksburg, Va., saved Burroughs more than \$800,000 in rework costs alone with a solution that embarrassed his superiors by its simplicity. Pfarr's idea was so simple, in fact, that he almost did not submit it.

Pfarr's ingenuity was matched, though, by the resourcefulness of an IBM employee who worked at his kitchen table to fashion a crude ribbon shield that alleviated a printer jamming problem. Formerly a customer service engineer at IBM's Customer Service Division in Chicago, Michael Brown worked with his own tools to design the shield that was later incorporated throughout the entire product line. For his efforts, which saved IBM at least \$400,000, Brown was awarded \$100,000.

Maria DeFazio, a technician at IBM's East Fishkill, N.Y., General Technology Division facility, also took home the company's maximum \$100,000 prize. According to a spokesman, DeFazio's suggestion that photo masks, which are used as stencils to transfer circuit patterns onto silicon semiconductor wafers, be preloaded into a special cartridge to reduce damage from loading and unloading saved IBM at least a quarter of a million dollars in repair and replacement costs.

One of the more complex employ-

Rolm, Plessey Settle Lawsuit

SANTA CLARA, Calif. — Rolm Corp. and Plessey Co. of the UK have settled a trade secret and copyright lawsuit initiated by Rolm.

The suit alleged that Plessey had misused Rolm's technology to develop the Plessey IDX private branch exchange, which Plessey has sold in volume in England.

Under the agreement, the two companies will modify and extend licensing agreements dating back to 1976.

Plessey will continue to distribute Rolm's Automatic Call Distribution system in the UK and will also continue to promote and support the Rolm computerized branch exchange in Australia.

ee suggestions involved a designer at NCR Corp.'s Columbia, S.C., engineering and manufacturing facility. Working on NCR's Tower 1632 mini-computer line, the designer earned a \$2,000 bonus for her ideas that, according to the company, "made a significant innovative addition to the simplicity of the Unix-based user interface for the Tower 1632."

And at Control Data Corp.'s printed circuit operation in Minneapolis, Minn., inner layer line operator Elizabeth Campbell was a winner in CDC's Bright Ideas program, which awards an additional week of vacation for cost-saving ideas.

Employees Seen Reaping Awards For Ingenuity

(Continued from Page 101)

moval program earned more than \$402,000 for their 11,000 winning ideas last year. The program works so well, according to coordinator Gerry Axmark, that Honeywell got an average of two suggestions from each of the 9,400 eligible employees. The maximum prize for the suggestions that saved Honeywell almost \$2 million last year was increased in 1981 from \$2,500 to \$5,000.

According to a company spokesman, NCR expects to pay out more than \$500,000 in 1983 through its Engineering/Developer Bonus Award program, which awards employees up to 10% of their salaries for winning suggestions. Like most of the other corporate award programs, NCR's system extends to workers on the production floor, making all 63,000 NCR employees eligible to participate.

In 1982, President Robert Price began Control Data Corp.'s Bright Ideas suggestion program with a bang, holding a teleconference with 40,000 employees at 108 facilities to announce the 25th anniversary scheme that awards an additional week of vacation to winning thinkers. CDC's spokesman Griff Kennedy said that for the winning ideas chosen from the 13,650 suggestions submitted, CDC awarded the equivalent of 25 years vacation. Kennedy said CDC intends to hold the Bright Ideas program for a three-month period each year.

Among the major computer manufacturers, only Digital Equipment Corp. is without a formal employee suggestion award program. In addition to the corporatewide plans described, most of the firms also had decentralized award programs at individual manufacturing facilities.

Not all the programs involve cash. Wang Laboratories, Inc.'s Product Idea Program, which started only last month, will give winning employees an opportunity to head the project team that will develop their ideas. And, at Hewlett-Packard Co.'s Boise, Idaho, manufacturing facility, suggestions chosen through the Boise Improvement Program were awarded with light-bulb pins and preferred parking for a month.

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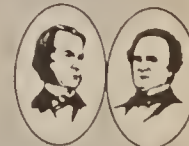
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Micro Shakeouts Forecast, But Optimism Grows

(Continued from Page 101)
sour for Victor six months ago, after IBM introduced its Personal Computer overseas.

"Whether Victor can turn itself around depends on two things," Killen said, "whether Walter Kidde [parent company that owns roughly 60% of Victor] can come up with assurances for the banks and more cash to tide Victor over; and whether the new management can continue to cut costs, get sales up and find other investors." He added that non-IBM-compatible Victor "never got its feet on the ground in the U.S., and this has come back to haunt it. The window of opportunity for Victor to sell in the U.S. closed six months ago, and it will be hard to reopen. [It] has a rough road ahead."

Despite Victor's troubles, it recently signed a large contract with Ford Motor Co. This, according to Esther Dyson, president of Rosen Research, Inc., is a "very important reaffirmation of support for Victor."

Vector Graphics recently announced its third consecutive quarterly loss, the resignation of two directors and a shortened work week for "many" employees. To date this year, the company has laid off about 25% of its work force. Vector "could be strong in the [computer-aided design] market," Stein maintained. If Vector were to target a niche market and avoid head-on competition with the IBM Personal Computer, "it could very well succeed," Bosomworth said. Dyson agrees that Vector has taken the "right step."

In response to Fortune Systems, Bosomworth said that Osborne Computer Corp. was "done in by its own stupidity" in that it alienated retail outlets. On the other hand, Fortune is in danger of alienating its customer base, he added. "Customers are unhappy with the machine and the software." He suggested that while Fortune may have finally resolved technical problems, it

remains to be seen whether customers will believe it — or care.

Earlier this month, Fortune reported a \$9.1 million loss on \$9 million in sales. The company attributed the loss to shipment delays and increased development expenses.

Fortune, which recently reorganized its management, is a "big question mark," Killen said. Despite the fact that its Unix-based computer system is not IBM-compatible, Killen said it has an advantage in that it is a multiuser, multiprocessor system. A single Fortune system is

cheaper than buying the same capacity in several IBM Personal Computers, he added. Dyson predicted the growing Unix market would mean "good news" for Fortune. However, she noted that Fortune has a "great idea" that has not been "successfully implemented."

Losses Continue for Micro Makers

By Patricia Keefe
CW Staff

The bankruptcy filings of two portable microcomputer vendors in less than two months has served to highlight recent announcements concerning quarterly losses and continued layoffs by a number of other financially troubled micro makers.

However, several industry analysts have denied that they see a pattern linking those struggling micro firms now treading the financial waters to those that have either pulled themselves out of

the market or have gone under in a sea of creditors and mounting losses.

Following on the heels of Osborne Computer Corp.'s disclosure of losses and its subsequent September filing for protection under Chapter 11 of the U.S. Bankruptcy Code, Computer Devices, Inc. of Burlington, Mass., filed a petition for Chapter 11 protection on Oct. 31 [CW, Nov. 7].

Some industry observers who spoke previously about a significant shakeout in the microcomputer market prior to and following the failure of Osborne, are now talking of a smaller "falling out" of about a quarter of the field in the wake of Computer Devices' action. Conversely, Michael Killen of Strategic, Inc., believes a major shakeout is in progress.

While companies with poor financing and matching marketing plans will continue to wither, the micro industry itself is healthy, according to Killen and Alex Stein, a senior analyst for Dataquest, Inc., a San Francisco-based research firm. "With personal computers growing at 70% and desktops at 60%,

the market [demand] can't possibly be in real trouble," Stein said.

And a number of business micro makers, such as Fortune Systems Corp., Vector Graphics, Inc. and Victor Technologies, Inc., long expected by some to constitute part of the market fallout, are getting cautiously optimistic appraisals by several industry observers (see related story).

Nevertheless, in the months ahead recovery for the weak and survival for the strong will not be easy for several reasons, according to analysts.

For one, there has been a markedly smaller infusion of funds into business micro concerns. Venture capitalists have become much more discerning, learning that it is better to give \$6 million each to five companies than to give \$3 million each to 10 companies, Stein said. Ventures hoping to receive second- and third-round financing "had better get it right the first time," he added.

Also, what has happened to the firms mentioned above reflects symptoms of a

(Continued on Page 108)

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Twentyfold Increase Posted In Net Earnings by Amdahl

SUNNYVALE, Calif. — Amdahl Corp. reported a greater than twentyfold increase in net earnings for the third quarter ended Sept. 30 as compared to the same period last year.

While revenues doubled to \$200 million from the \$100 million reported for the previous third quarter, net earnings rocketed to \$13.7 million, or 30 cents per share, compared with \$630,000, or two cents per share, in the slack period the prior year.

According to John C. Lewis, Amdahl president, "The company's record revenues and improved earnings reflect the growing volume of shipments."

Amdahl's pretax income for the third quarter was \$23 million, up from the \$1 million reported in the three-

month period in 1982. For the nine months ended Sept. 30, Amdahl reported total earnings of \$30.7 million, or 69 cents a share, which includes \$3.2 million, or seven cents per share, in extraordinary credits from utilizing a subsidiary's prior year accounting losses and tax credits; for the same period last year, Amdahl reported earnings of \$4.09 million.

Shakeout May Only Be 'Falling Out'

(Continued from Page 106) larger problem, Stein believed. "As large vendors enter the market with personal computers, they are closing out corporate sales opportunities for the smaller vendors. The latter have two options — either sell through retail or direct sales or develop products for niche [vertical] markets," he said.

While Stein noted that niche market shares have not turned out to be large value-added markets and that prices are continuing to erode, Harold Kinney of Future Computing, Inc. does not see a market for hardware tailored to these markets. But Barbara S. Isgur of Paine Webber Mitchell Hutchins, Inc., believed that by coupling different software with its hardware, a vendor can market in 10 different niches and attain profitability.

Also, as more small businesses gain familiarity with computers or make automation a priority, niche markets will grow.

Both Isgur and Kinney said that IBM has set the micro standard. Kinney pointed to a recent Future Computing survey of 2,000 of the largest micro users that "revealed the absolute dominance of IBM and compatibles in the market." Although Esther Dyson, president of Rosen Research, agreed that vendors must be IBM-compatible, she predicted there will be many exceptions and stressed that it will take more than IBM-compatibility to succeed in the market.

M/A-Com's Earnings Drop 25%

BURLINGTON, Mass. — M/A-Com, Inc. recently reported fiscal year 1983 earnings from continued operations dropped almost 25% from the previous year, despite a more than 8% increase in sales.

The company reported net sales of \$637 million for the fiscal year just ended, compared with \$702 million a year earlier; income from continuing operations, however, dropped to \$31 million

for fiscal year 1983, compared with \$42 million the previous year. Earnings per share were 76 cents for the year just ended compared with \$1.08 the previous year.

For the fourth quarter just ended, the company reported record sales of \$174 million, compared with \$160 million one year earlier; but earnings for the quarter were \$8.9 million down from \$9.3 million last year.

Projecting improved per-

formance in 1984, Richard T. DiBona, company chairman, president and chief executive officer, said, "Although the company's growth in fiscal 1983 was slowed by economic factors, heavy research and development, softness in the cable television market and new markets that have developed more slowly than anticipated, we did achieve, as predicted, sequential improvement in our earnings."



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Standard mainframe-level business application development software for **Wang Laboratories, Inc.**'s Professional Computer will be available in December as a result of a recent marketing agreement between Wang and **Micro Focus, Inc.** Micro Focus will deliver Level II Cobol, Anamator, Forms-Z and native code generator software beginning the fourth quarter of 1983. The

products will be available from Wang in December. The native code generator will convert the Level II Cobol intermediate code to the Professional Computer's 8086 native machine code under the Microsoft, Inc. MS-DOS operating system, reportedly allowing it to compile and run faster than any comparable software. The agreement is valued at more than \$500,000.

Stratus Computer, Inc. of Natick, Mass., and **HMC Computer Corp.** of Toronto, Ont., have announced an agreement granting HMC the exclusive right to market Stratus 32-bit, fault-tolerant computer systems to the Canadian banking, brokerage and insurance industries. The two-year agreement, which includes foreign banks doing business in Canada, is valued in excess of \$2

million. In addition, HMC has nonexclusive rights to sell the Stratus/32 continuous processing system to the general Canadian market.

Calma Co. has formed a government and custom systems organization to market its computer-aided design and manufacturing (CAD/CAM) systems exclusively to the U.S. government and its departments. In addition, the

new sales operation will provide custom system software and interface services, including equipment exchange and data conversion that will allow a buyer to convert existing CAD/CAM equipment and/or data base to Calma products.

A commercial single-mode, fiber-optic transmission system was inaugurated on Sept. 14 by **ITT Telecom Network Systems Division** and **Continental Telephone Co.** of New York. It is reported to be the first system capable of carrying enormous amounts of telephone traffic for long distances without intermediate amplifiers or repeaters. The 90M-byte FTS-3C system, manufactured by ITT Telecom, links two of Continental's digital central offices over a span of 23 miles and is capable of 1,344 two-way telephone channels.

Mini-Computer Business Applications, Inc. (MCBA) has filed a lawsuit against Donald Lamka and several corporations of which he was an officer, seeking \$5 million in compensatory and punitive damages for breach of contract, unfair competition, fraud, conspiracy and conversion, as well as declaratory and inductive relief stemming from the alleged unauthorized distribution of MCBA products in violation of written license agreements between the parties. Implicated in the suit are the Ohio Corp.; Point of Sale Business Systems, Inc.; Universal Sales Companies, Inc.; Universal Gymnasts, Inc.; and Digital Software Consultants, Inc.

Western Electric has been awarded a \$30 million contract by the U.S. State Department for a new integrated voice/data telephone system to serve 16 separate locations in the Washington, D.C., metropolitan area. Western Electric will engineer, furnish, install and maintain the system, which is scheduled to be operational by March 1985.

Gensoft Corp. and **Tartan Laboratories, Inc.** have announced plans to develop jointly and market Ada compilers.

A local-area network containing a multiuser turnkey computer system worth \$12,500 will be given away by **Alspa Computer, Inc.** at the fall Comdex show in Las Vegas next week. Alspa Computer will be located in East Hall, Booth 2272, and the drawing will be on the final day of the show.

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DP Expo Set for Colorado

AURORA, Colo. — The sponsors of the 7th Annual Rocky Mountain Data Processing Expo and Conference, scheduled for April 18-20 in Denver, are seeking exhibits for the show.

The sponsors include the Mile High Chapter of the Data Processing Management Association (DPMA) and Industrial Presentations West, Inc. The 1984 show will be run in conjunction with the DPMA Region 4 conference.

Members of 22 separate chapters from a nine-state region will be invited to attend, a spokesman said. This year's show reportedly will in-

Ameritech,

Aetna Announce Local Net Plans

WESTBOROUGH, Mass. — Plans to co-develop a new fiber-optic, local-area network business communications system were recently announced here by American Information Technologies Corp. (Ameritech) and Aetna Telecommunications Laboratories.

The software-based local-area network would provide simultaneous high-speed transmission of voice, video and data on single or multiple fiber-optic cables, according to spokesmen for both companies.

Funding for research and development will reportedly be provided by an Ameritech subsidiary, Ameritech Development Corp., but neither the new company nor the parents will be involved in actual manufacture of the product.

Ameritech is also the parent company of five Midwestern telephone companies: Illinois Bell, Indiana Bell, Michigan Bell, Ohio Bell and Wisconsin Telephone.

Aetna Telecommunications Laboratories is a partnership composed of GRE Technology, Inc. and Aetna Diversified Technologies, which is a wholly owned subsidiary of Aetna Life and Casualty Co.

Nynex to Market GTE Products

RESTON, Va. — GTE Business Communication Systems, Inc. recently announced an agreement in principle for distribution of its products and systems by Nynex Corp., the parent organization of the New York and New England Telephone Companies.

The agreement is for a three-year period and calls for Nynex to purchase the GTE Omni series and GTD-5 private automatic branch exchange (PABX) systems, a spokesman said.

The Omni series, announced this fall, is an integrated voice/data communications system serving up to 2,084 ports with a dual-bus architecture. The GTD-5 is a digital PABX that can handle up to 50,000 ports.

The agreement goes into effect Jan. 1, when the seven regional Bell operating companies are scheduled to begin operation.

clude a technical track and an increased number of conference sessions, the spokesman said.

The price of booth space includes draped space, company name sign, complimentary entrance tickets for clients and prospects, identification badges for all personnel staffing the booth, general security, conference registration package and a sales seminar, "How to Sell in a Trade Show Environment."

A 10- by 10-ft draped booth costs \$900, with a 10% discount for multiple booths. Booth space is said to be 35% sold out. Exhibitors can reserve space by contacting Industrial Presentations West at Suite 304, 3090 S. Jamaica Court, Aurora, Colo. 80014.

ITT Reports Earnings Drop For First Nine Months of '83

NEW YORK — ITT recently reported reduced revenues and earnings for the first nine months of its fiscal year, but expressed optimism that the fourth quarter will bring improvement.

Third-quarter earnings from operations rose 23.5% compared to the corresponding period one year ago, but total earnings for the quarter were off almost \$13 million from the earlier period.

The earnings decrease was attributed to a third-quarter 1982 one-time \$33 million benefit from a favorable settlement of an antitrust suit against AT&T. That boosted earnings in the 1982 period to \$118.5 million, or 80

cents per share, 11% higher than the \$107 million, or 70 cents per share, for the quarter just ended.

For the nine-month period, earnings were 9% lower than for the same period last year, while sales and revenues this year are \$1.3 billion less than the \$16.3 billion reported for the corresponding period last year.

ITT Telecommunications contributed a \$15 million increase in earnings for the nine-month period this year; a strong performance from the Defense-Space Group, substantial improvement at Telecom North America and generally stronger operations in Europe all impacted the improvement, the company said.

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Inmos T-424 Chip Boasts Major Tech Advance

By Robert Batt

CW West Coast Bureau

SAN FRANCISCO — Calling it "a major advance in microprocessor design," Inmos Ltd. of Britain has announced the development of a 32-bit chip with an instruction rate in excess of 10 million instructions per second (Mips).

Not slated for volume production until 1985, the T-424 chip is the first of a family of high-performance microcomputers and device controllers, the company said. Other products slated to be introduced include a 16-bit chip, a disk controller and a graphics controller.

Introducing the T-424 at the recent Western Semiconductor (Wescon) show, Ian Barron, managing director of the government-backed enterprise, claimed the chip provides all the resources of a computer, including pro-

cessing, memory and concurrent communications on a single chip.

"The initial chip products ... integrate 250,000 components on a single chip using two-micron Cmos technology. They provide standard inter-chip communications links and support a programming model which incorporates multiprocessing," Barron claimed.

According to the company, which has research and development facilities in Colorado Springs, Colo., the product contains a processor with access to 4K bytes of on-chip static random-access memory (RAM) to achieve a cycle time of 50 nsec. The memory, Barron said, can be extended off the chip through a specialized memory interface enabling direct connection to both static and dynamic RAMs and providing data rates of up to 26M

byte/sec.

In addition, he said, there is a specialized peripheral interface enabling industry-standard products such as device controllers and read-only memory products to be interconnected.

The chip is also said to have four high-speed serial communications links enabling interconnection with other chip products. These

links, Inmos said, support message transfers and can operate concurrently with the processor and the peripheral interface.

While applauding the technological achievement that the chip apparently represents, several industry observers are adopting a wait-and-see attitude.

A typical comment came from Seth Goldwin, senior

analyst at Paine Webber, Mitchell, Hutchins in New York. "On several occasions, Inmos has come out with real technological achievements, but their problem has been turning them into solid commercial successes. The task facing the company now is how to turn a fantastic engineering accomplishment into a commercially viable product."

Inmos' Transputer: A System on a Chip

By Rex Malik

Special to CW

Reading the specification sheet, what first hits you is that the Transputer, the T-424 chip announced recently by Inmos Ltd. (see related story), combines processor, memory (4K bytes) and communications on a single chip. Next, you find that by going down this route, this gives the processor a memory throughput of up to 10 million instructions per second (Mips).

Then you find that the chip contains 250,000 devices, and that it is still no more than 45 millimeters square. This is more than double the density that is currently the industry norm, and that is usually found in single-function devices, not mixed.

It is the first attempt by a high-grade silicon manufacturer to develop as a standard product what has been obviously feasible since reasonable amounts of integration became possible: the building of a system on a chip. And a system is what Inmos called it.

Competitors Growing

It is a 32-bit system, and it competes initially with, among others, chips from National Semiconductor, Inc. and Hewlett-Packard Co., Intel Corp. and Motorola, Inc. are expected to join them in the next year or so.

When quantity deliveries, slated for 1985, begin, Inmos could well have some competition, though based on present indications, that

competition will not offer a processor, memory and communications on one chip.

The Transputer is essentially a long-term project, one primarily aimed at large-systems manufacturers. Though Inmos claims it works well in existing architectures and with existing software approaches, it is primarily aimed at systems of the power that everyone agrees will be in fifth generation, those parallel processors now under development in the U.S., the UK and Japan.

Parallel Systems Use

Though the Transputer may well end up powering simple electronic devices on the basis of one device, one Transputer, it really has been devised to interconnect with other Transputers in the creation of large parallel systems.

The first of the parallel systems to use the Transputer is currently being devised by a team at Imperial College in London, the UK's nearest equivalent to MIT. This is a 32-parallel-processor system, each processor in turn being based on a number of Transputers.

Until now, Inmos has been best known for its 16K-bit random-access memory chips. Inmos has been funded by more than \$150 million of British taxpayers' money, though the expectations are that there will be substantial injections of private capital over the next year as the British government seeks to privatize it.

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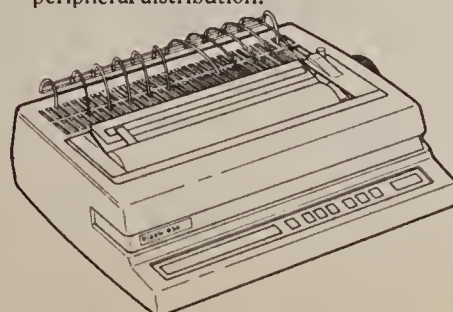
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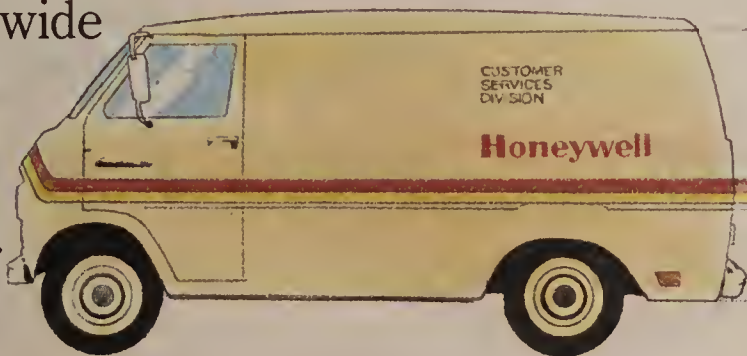
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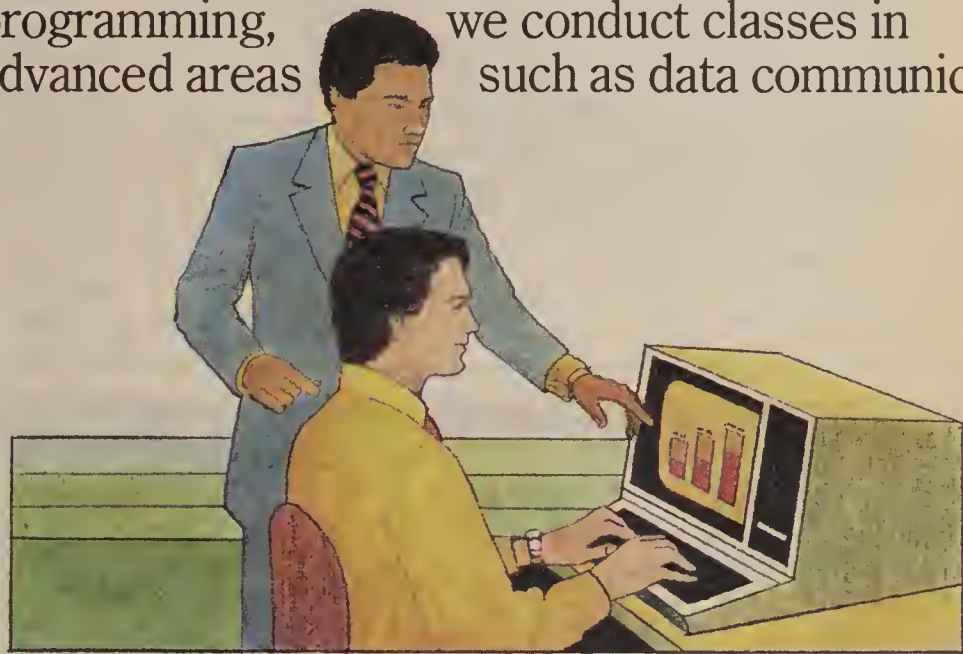


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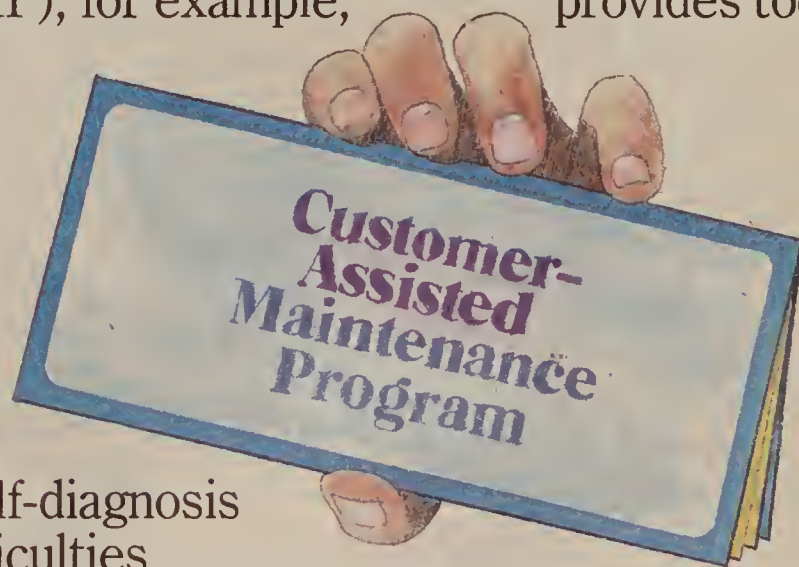


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Indigenous Product Lines Favored

Hard Times Seen for IBM in Japan's Micro Mart

TOKYO — While over a million micros are expected to be sold in Japan this year, even optimistic sources here don't give IBM's Personal Computer more than a 15% share of the Japanese market, as Japanese consumers continue to favor indigenous microcomputer product lines.

This was the opinion of

Luc Sala, editor of *Computerworld's* Dutch affiliate, *Micro/Info*, a monthly microcomputer magazine. Sala reached this conclusion during a recent visit to Japan, where he attended "Data-show Tokyo," one of the country's major trade events that hosted some 25,000 guests this year.

Sala said Japan has, to a

large extent, adopted Microsoft, Inc.'s MSX (Extended Basic) as an operating system standard, a system not now offered on IBM's machines. This de facto standard will expand the home market in Japan "enormously," Sala said.

"In the under-\$200 [system] class, MSX provides a uniform standard and will

lead to more sales of Japanese hardware and software. However, the capabilities of MSX are so limited that the only practical applications are in the recreational and maybe the home-educational market," Sala noted.

"For more business-oriented applications, MSX is not really appropriate. And even for the home, where we

expect further integration of video and computers — the X1 TV Computer combination from Sharp Associates is a successful consumer product here — the MSX standard is too limited," he added.

Sala said software for the MSX-based machines is readily available from a number of sources and Microsoft, Inc. channels. He also maintained that although the life span of the MSX products is probably a short one, it is a good way to make Japanese society computer-literate. "What Sinclair did for the UK, MSX is likely to achieve for Japan," Sala remarked.

Portable computers represent another burgeoning market area in the Far East, Sala noted. Popularly known as lap computers or "toteables," portables are especially popular in Japan because the Japanese language allows much more to be related with fewer characters, relative to other languages. Thus, the Japanese are not as limited by a small screen or printer.

The next generation of portables is looming on the horizon, Sala said, and will consist of 16-in. by 20-in. screens, 16-bit processors, integrated software and greater performance capabilities than the present portables, all at a lower price.

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McAuto Inks AIS-II Pact With Gould

FORT LAUDERDALE, Fla. — Gould, Inc.'s Computer Systems Division recently obtained exclusive marketing rights to McDonnell Douglas Automation Co.'s Advanced Instructional System-Second Generation (AIS-II) training software for use on Gould Concept/32 computers.

Vel Casler, a Gould vice-president, said the agreement is in line with the company's strategy of placing more third-party application software on its machines.

AIS-II is a computer-aided and managed instruction (CAI/CMI) package that has functional capabilities and modular architecture.

Casler said the pact marks Gould's entry into the computer-based training market; the company believes the industrial and government sectors present a high-growth market for CAI/CMI.

The software will run under UTX, Gould's version of Unix, on the company's 32-bit minicomputers.

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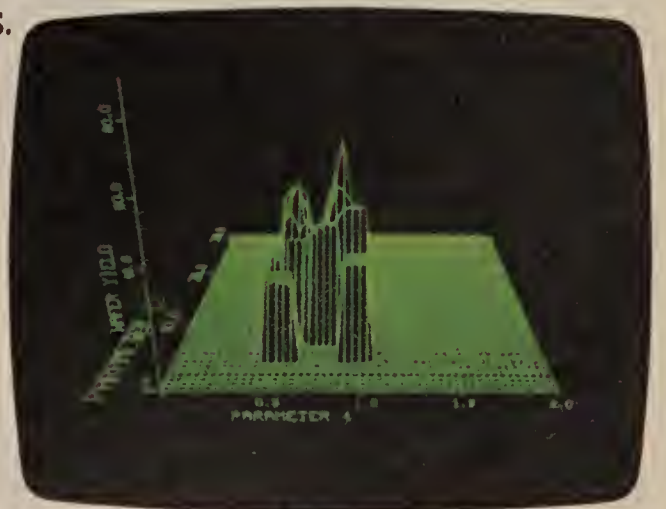
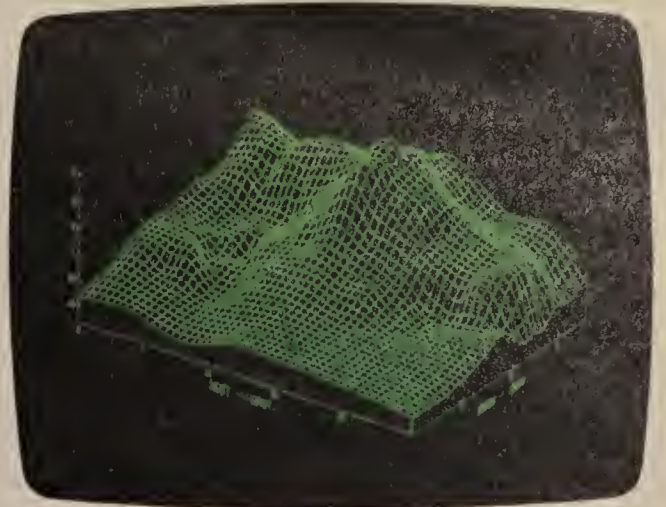
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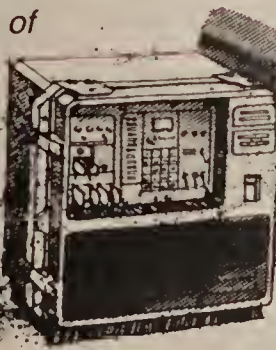
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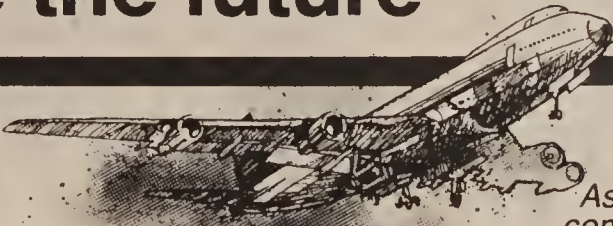


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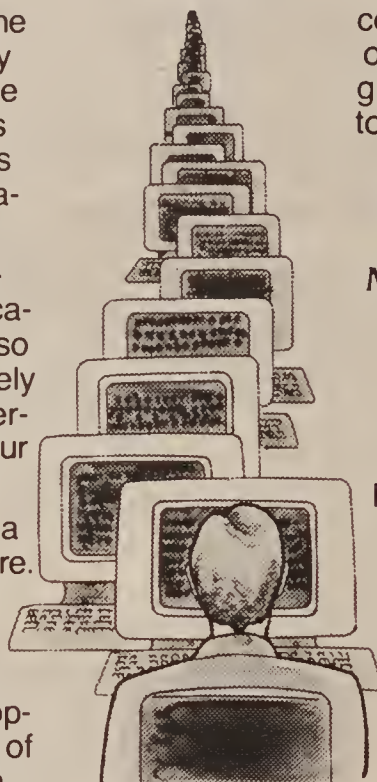
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NETWORK CONSULTANT: Coordinate conversion of companies from current data communications network, work up plans describing changes, perform as a Project Manager. BS or equivalent with 4 years experience with data communications. Should have exposure to packet switching technology and IBM communications hardware/software.

SENIOR SYSTEMS PROGRAMMER: Development, maintenance, testing of SNA and other network projects. 3-4 years in systems programming. BS in Computer Science. Knowledge of SNA protocol and packet switching networks.

PROGRAMMER: Develop and implement data bases for accounting, network traffic, statistics and billing systems. 2 plus years programming experience with knowledge of NOMAD and FORTRAN.

We offer the opportunity for client contact, problem solving, personal growth, travel, and the expansion of your technical capabilities.

For the ambitious person, these positions offer maximum opportunity for growth as well as excellent benefits. Salary commensurate with experience.

For immediate consideration, please send your resume along with salary requirement to:

Tricia Vongsarajana
DunsNet, Inc.
Personnel Administrator
Box B
187 Danbury Road
Wilton, CT 06897

We are an Equal Opportunity Employer

Data Base Administrator

The Pan American Health Organization is seeking qualified candidates to serve as its Data Base Administrator. Requirements include university degree in mathematics, information science, computer science or another appropriate specialty as well as experience within a major data processing installation using COBOL or PL/I and ADABAS. Data base experience should include the following skills:

- Data Base Design and Implementation
- Data Base Tuning and Monitoring
- Data Base Integrity and Security Planning and Implementation
- Data Base Dictionary Operation and Control
- Definition of Access Strategies, Standards, and Control
- Data Base Systems Evaluation, Installation and Control

Interested individuals should forward their resumes to:

Pan American Health Organization
Department of Personnel
525 23rd Street, N.W.
Washington, D.C. 20037

SOFTWARE DESIGN ENGINEERS

Join a well-funded, rapidly growing product development effort in Portland, Oregon. Participate in the development of a database computer that advances the state of the art. All positions require a bachelor's degree in computer science or a related area, and structured design experience. VAX/VMS experience a definite plus.

Man/Machine Interface Design (Lead Position)

- 5 years experience designing and implementing user-friendly, interactive interfaces for bit-mapped or cursor-addressable displays.
- 3 years interactive graphics experience.
- 3 years Fortran experience.
- Database experience.

Man/Machine Interface Design

- 3 years experience designing and implementing user-friendly, interactive interfaces for bit-mapped or cursor-addressable displays.
- 2 years interactive graphics experience.
- 2 years Fortran experience.
- Database experience a plus.

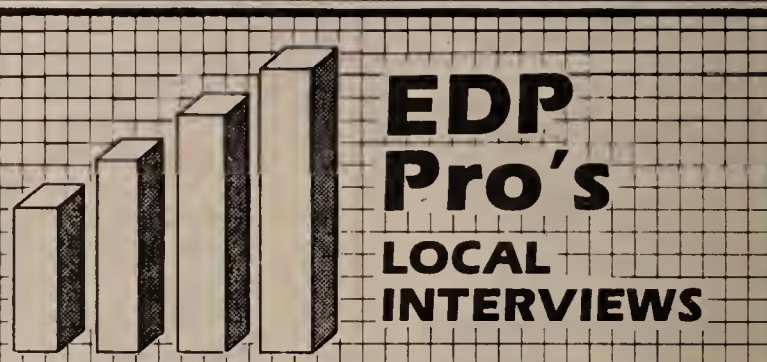
Software Evaluation (Lead Position)

- 5 years experience evaluating software written in a high level languages.
- In depth knowledge of test case and test driver design.
- Must have evaluated a large software product such as a compiler, interpreter or data base system.
- PASCAL and Fortran experience.
- Graphics, database, Smalltalk, Unix are pluses.

Excellent facilities located in the heart of Portland, yet minutes from uncrowded suburban living. Highly competitive salaries, excellent fringe benefits, equity in the product, plus relocation. Because we are a small company, the work of each individual is important. Design teams are small and the atmosphere is informal. Close to skiing, boating, mountain climbing and ocean beaches.

Send resume plus cover letter stating position of interest, salary requirements, plus other particulars in confidence to:

Allen Jones
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Product Development Company
2700 Georgia Pacific Building
Portland, OR 97204



Get all the growth you can handle!

At AP Telecomputing Corporation, our track record speaks for itself. We've experienced a 300% growth rate this year, and project a 200% increase for next year. If you're serious about career advancement, now's the time to join this totally DP-oriented organization.

GROUP MANAGERS—5-10 years experience as systems, programming or data processing manager. Proven ability to supervise 15+ people.

PROJECT MANAGERS—3-5 years experience as project, systems or programming manager.

SR. PROGRAMMER ANALYSTS—5-10 years experience in systems design and programming.

PROGRAMMER ANALYSTS—At least 3 years in systems design and programming.

(For above two positions, COBOL, CICS/IMS, TSO, SAS and ALC desired.)

With a prestigious roster of clients throughout the USA, Canada and South America, we're able to offer excellent salaries and benefits. Plus the opportunity to support advanced R&D efforts at our plush, new West Palm Beach headquarters.

To arrange a local interview, rush us your resume with salary history today to: AP TELECOMPUTING CORPORATION, P.O. Box 2091, 439 Fern Street, West Palm Beach, FL 33402. Equal Opportunity Employer, M/F.

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S O F T W A R E P R O F E S S I O N A L S

IF YOU LIKE THE CHALLENGE OF A NEW JOB, DIGITAL HAS A JOB THAT CHALLENGES YOU AGAIN AND AGAIN.



To fill them, we are looking for experienced software professionals at all levels. Appropriate applications experience, familiarity with Digital products, and advanced degrees are highly desirable.

Successful candidates will get the fully competitive salary, excellent benefits, and unparalleled advancement opportunities only the world's second largest computer company can provide. Some positions may require U.S. citizenship.

And, these software positions are available in your choice of Digital locations around the country.

That's because your job with Digital can change with you as your interests and your capabilities change. You can be in on any of a large variety of leading edge projects in finance, manufacturing, health, communications, robotics, artificial intelligence. Or in any of the other areas Digital serves. You'll participate in these projects from conception through production, marketing through sales, in an unstructured environment that rewards initiative rather than seniority. So, when you successfully finish one assignment, you'll move right on to another challenging opportunity.

There are opportunities for Applications Programmers to work on forms management systems, transaction management, and distributed office automation. For Software Support Specialists to consult with Digital field service representatives, using knowledge of Digital operating systems, to solve customer problems. And for Software Specialists in sales, installation, warranty and contract services. All these positions support Digital's personal computers—Rainbow 100, DECmate II, and Professional 350—PDP-11 and VAX systems.

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Santa Clara, San Francisco/Oakland, Seattle/
Portland, Denver, Salt Lake City, Colorado Springs

Write to: Employment Representative
Digital Equipment Corporation
Dept. CW 1121
2525 Augustine Drive
Santa Clara, California 95051

CENTRAL REGION—
Chicago, Minneapolis, Detroit, St. Louis,
Indianapolis, Milwaukee

Write to: Employment Representative
Digital Equipment Corporation
Dept. CW 1121
North Atrium Center, Building 1
1155 West Dundee Road
Arlington Heights, Illinois 60004

NORTHEAST REGION—
New England and Upstate New York

Write to: Employment Representative
Digital Equipment Corporation
Dept. CW 1121
5 Burlington Woods Drive
Burlington, Massachusetts 01803

NEW YORK/NEW JERSEY REGION—
New York City, Westchester, Long Island,
Parsippany, Piscataway

Write to: Employment Representative
Digital Equipment Corporation
Dept. CW 1121
Corporate Park 287
20 Corporate South
Piscataway, New Jersey 08854

MID-ATLANTIC REGION—
Washington, D.C., Philadelphia, Ohio Valley

Write to: Employment Representative
Digital Equipment Corporation
Dept. CW 1121
8301 Professional Place
Landover, Maryland 20785

SOUTHWEST REGION—
Los Angeles area, Orange County, San Diego,
Phoenix, and Albuquerque

Write to: Employment Representative
Digital Equipment Corporation
Dept. CW 1121
6101 West Centinela, Suite 1
Culver City, California 90230

SOUTHERN REGION—
Houston, Dallas, Atlanta, Charlotte, Knoxville, New
Orleans, Memphis, Tampa, Orlando

Write to: Employment Representative
Digital Equipment Corporation
Dept. CW 1121
5775 Peachtree Dunwoody Road, Suite 100-D
Atlanta, Georgia 30342

If interested, send your resume or a letter outlining your qualifications to the employment representative at the location that interests you. We are an affirmative action employer.



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OFFICE AUTOMATION/ INFORMATION PLANNING EXPERT

The National Cancer Institute (NCI), National Institutes of Health, Public Health Service, is seeking a professional to establish an organizational unit to provide planning, developmental, and management support to the Office of the Director and the five operating divisions in the area of office automation and information planning (OA/IP). The Institute is the lead Federal agency in cancer research and is responsible for coordinating the National Cancer Program. Its mandate includes both basic and applied research programs related to the understanding of the causes of cancer, and improvements in detection, diagnosis, treatment, and rehabilitation.

The objective of this effort is to improve the efficiency and the effectiveness of Institute operating systems. With a budget of approximately 1 billion dollars, the Institute reflects a complex management system with the possibility of major gains in efficiency by appropriately incorporating current and projected advances in office automation. The incumbent will be responsible for the initial staffing of the unit with Federal employees.

Applicants should have formal training in information management, computer science, engineering, management, or operations research as well as experience in OA systems design and selection, experience and training in data communications technology and application of OA technology (hardware and software). Experience in local area networks, federal procurement regulations and project management is desirable.

Qualifications:

Requirements: Formal training should include a BA in one of the following areas and at least 1 year of training in a second area

listed: information management, computer science, engineering, management science, and operations research.

At least five years total recent "hands on" experience in the following two areas is required:

- systems analysis, design, and selection for information or OA systems
- OA technology applications including hardware, software, and data communications aspects

Experience in local area networks, federal procurement regulations and project management is desirable.

The position of Expert has a duration of 2 years. The salary range will be \$48,553—\$63,115 depending on the expertise and experience of the individual selected for the position. The applicant selected will be covered by Civil Service Retirement and will be eligible for life insurance and health benefits.

The position is located at the NIH Campus in Bethesda, Maryland.

NIH is an equal opportunity employer.

Interested persons should submit a SF-171 (Personal Qualifications Statement) by January 3 to:

Ms. Valerie Berlew
Personnel Management Branch
National Cancer Institute
Building 31, Room 3A23, 9000 Rockville Pike
Bethesda, Maryland 20205

If additional information is needed, please call Ms. Berlew at 301/496-6864.



SENIOR DATABASE ANALYST

Tenneco West, a major producer and marketer of agricultural food products, has an excellent career opportunity available for an experienced database analyst. The successful candidate will join the Database Administration Group and will be responsible for database analysis and planning and for both Logical and physical database design. This position requires a minimum of 2-4 years of database analysis experience. Experience with IDMS database software is highly desirable.

The systems environment includes an IBM 4341 running DOS/VSE under VM/CMS with CICS. IDMS is installed along with OLQ, AD-S/ON-LINE, IDD, and IDMS DC/UCF. Major database applications include CFS-general ledger and CIMS-inventory control, MRP and BOM.

We offer a new and growing database environment providing challenges and opportunities for individual growth. This opening is in our Bakersfield, California office. We offer excellent benefits and working conditions. Salary commensurate with experience and background.

Send resume and salary history in confidence to:

EMPLOYMENT MANAGER
TENNECO WEST
P.O. Box 9380
Bakersfield, CA 93389

E.O.E.

M/F/H



INFORMATION SYSTEMS DIRECTOR

The leading multi-hospital system in Western New York will be expanding Information Systems to extend its aggressive growth plans. An opportunity exists for a data processing executive to manage our total information system and be a key member of our management team. The successful candidate will possess a track record that demonstrates a unique blend of technical, business and people skills. A record of accomplishments in a technically sophisticated environment is required along with an appropriate degree and related managerial experiences.

The compensation and relocation package for this position is designed to attract the highest caliber individual. Please send your resume and salary history to: Personnel Office, Millard Fillmore Hospitals, 3 Gates Circle, Buffalo, NY 14209. EOE/M/F

ENERGY INDUSTRY EDP PROFESSIONALS

Compensation to \$80K Plus

One of the premier Geoscience Data Processing Centers in the world is seeking the best talent in the industry. If you are degreed, with experience in large IBM mainframe and/or CRAY vector processor environments send us your resume or call today.

We are seeking both senior technical and management level personnel in the following areas:

MVS or VM Operating System Software
MODEL 204 Software Support
Exploration Interpretation
Seismic Processing
Reservoir Simulation
Petroleum Engineering
Geophysical/Geological Processing
"Information Center" Management

ENSMINGER, INC.
1800 West Loop South
Suite 1580
Houston, Texas 77027
(713) 960-9604

SYSTEM ANALYST, SENIOR-Designs systems, & develops application programming specification (of moderate difficulty) upon approval of systems requirements specs. Conducts technical reviews of application programming specs with technical support & database administration. Teaches & assists less exp. analyst/programmers in system development, programming & testing activities. Must be familiar with assembler, RPG II and RPG III, Fortran, Cobol, PL-1 & basic computer language. 40 Hrs/wk. \$34,000/yr. B.S. Degree computer science. 5 yrs. exp. Send resume to: Kelsey National Corporation, 1801 Century Park East, Suite 1250, Los Angeles, CA 90067.

NEW ENGLAND EDP OPPORTUNITIES

Outstanding opportunities exist in New England for Program Managers, Project Leaders, Systems Programmers, Systems Analysts, Programmer Analysts, Software Engineers, with two plus years experience. Experience 'quality of life' while achieving your career goals. Call or write today in total confidence:

KUEBLER
ASSOCIATES
Data Processing Division
Executive Office Center
Two Monument Square
Portland, ME 04101
(207) 774-9100

FIELD ENGINEERS

Dataserv Computer Maintenance is expanding nationwide. We now have immediate openings in major cities and will be adding more in the near future.

These are key positions and provide excellent opportunities that will lead to further promotion in a fast growing company. Excellent compensation plan and good fringe benefits for experienced individuals. Your potential for personal advancement with a \$100 million plus company is the greatest right now as we expand.

We now have immediate openings in these cities for these positions:

Richmond, Virginia - FIELD ENGINEER

We have immediate opening for experienced I/O Field Engineer to maintain IBM disk and tape equipment.

Milwaukee, Wisconsin — FIELD ENGINEERS

Immediate opening for engineer with experience on IBM tapes, printers, disks, display equipment.

Dataserv will soon have additional opportunities for field engineers and technical specialists in several other major cities throughout the United States. If you are considering a change in employment, contact Dataserv for a review of what we have to offer.

For immediate consideration and more information call Toll Free — 800-328-6729 or send your resume to: Bev Walters, Dataserv Computer Maintenance, Inc., P.O. Box 3003, Hopkins, MN 55343. We are an equal opportunity employer and all inquiries are considered confidential.

dataserv

SYSTEMS SOFTWARE SPECIALIST

A large Midwestern manufacturing firm seeks an experienced Software Specialist (systems programmer) to plan, install, enhance, tune, and maintain operating system software in IBM OS/MVS, DOS/VSE, and VM/SP environments.

Required qualifications include proficiency in IBM System/370 assembler language, OS/MVS JCL, working knowledge of OS/MVS internals, and 2 to 4 years experience in installation/maintenance of OS/MVS.

Preference will be given to candidates with Bachelor's Degree in Computer Science, Engineering, or other sciences; experience with CICS/VS, DL1 or IMS/VS, IDMS, VM/SP/CMS internals and maintenance, and DOS/VSE maintenance; experience in converting from a DOS/VSE production environment to OS/MVS.

This position offers the opportunity for career development and excellent salary and company-paid benefits. Please forward resume and salary requirements to:

CW-B4314
Computerworld
Box 880
Framingham, MA 01701
An Equal Opportunity Employer

TELECOMMUNICATIONS CONSULTANTS

Logica's Consulting Division in New York has earned a reputation for high quality technical and business analysis on domestic and international telecommunications, software and information systems. We are expanding our team, and seek energetic, talented and ambitious people with superior presentation and writing skills. Career opportunities exist in the following areas:

VOICE NETWORK PLANNING

Candidates should have at least five years' experience in cost analysis, planning and/or design of public or large private voice networks. Familiarity with new technologies, tariffs, services and equipment is essential.

DATA NETWORK PLANNING

Candidates should possess a minimum of five years' experience in cost analysis, planning and/or design of public or private data networks. Experience in both packet-switching and local area networks is highly desirable.

If you are interested in challenging technical work coupled with an excellent salary and benefit package, please send resume, including salary history, to:

Carla Rodstrom, Personnel Administrator
Logica Inc., 666 Third Ave., New York, NY 10017

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CALLING
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INTO
THE
21ST
CENTURY.

Pacific Telephone is leading the way into the Information Age! Now you can be among the first to work in our exciting, new state-of-the-art center in San Diego.

STAFF ANALYST

As an integral part of our timesharing organization, you will be responsible for systems software maintenance, systems gens and performance. You will also be involved with programming and some assembler utility routines. You will qualify if you have 2-3 years' VM/CMS systems programming experience. A BS or Computer Science degree would make you especially competitive as would strong oral/analytical communication skills. This job may require some overtime and travel. One major highlight of this position is that you will have the professional freedom to work in an unsupervised, unstructured environment. Salaries for this position can range from high 20's to high 30's (depending on qualifications) and our benefits are outstanding.

Turn your future into an exciting place to be by sending your resume to **PACIFIC TELEPHONE, Management Employment, 1001 Wilshire Blvd., Suite 200, Dept. EG-703, Los Angeles, CA 90017.** Relocation not provided. No agencies, please. We are an equal opportunity employer.



Pacific Telephone

SPARK NEW IDEAS IN
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Seven years ago, DATAPOINT introduced the world's first local area network ARC® (Attached Resource Computer®), and ignited a revolution in business communications. Today, DATAPOINT's comprehensive approach to office communications, dispersed data processing, and desktop computing is continuing to make major demands on software technology.

PROJECT AFTER PROJECT, YOUR SPARK WILL BECOME BRIGHTER AND BRIGHTER Working with excellent resources and some of the best minds in the industry, you'll be able to achieve recognition and professional advancement rapidly in this 'electric' atmosphere. We want to talk with software professionals with skills such as:

OPERATING SYSTEMS PROGRAMMERS - From a creative point of view, you will design and implement current as well as future operating systems and utilities. You'll need knowledge of Assembly, Pascal and "C".

QUALITY ASSURANCE PROGRAMMERS - Working

closely with software designers, you will apply technical and interpersonal skills to the complex and challenging task of software verification. Knowledge of testing methodologies helpful.

OFFICE AUTOMATION PROGRAMMERS - You'll be a part of a highly skilled professional team developing the office of the future - stressing reliability and user friendliness. Programming experience using high level "C" and similar languages, and interactive software tools is desired.

SUPPORT ANALYSTS - Your team will be the key group in support of state-of-the-art operating systems, utilities, languages, communication and networking products. You'll need to be a strong communicator and problem-solver. Systems programming and/or support experience helpful.

DOCUMENTATION WRITERS - We're looking for proven communicators with skills in operating systems, languages, communications, and office applications. End-user documentation experience preferred. Knowledge of on-line documentation, "Help" facilities,

and other user aids helpful.

CAE SYSTEMS PROGRAMMER - To support development and integration of graphic and modeling libraries for advanced CAE/CAD tools. Experience in database design and operation coupled with knowledge of CAD/CAM systems required.

SYSTEMS SOFTWARE ARCHITECT - You'll make major contributions to the team developing advanced multifunction workstations. Experience with high level languages and operating systems required.

ACTIVATE YOUR SPARK NOW - If you've always wanted to be in on the starting team in a new technology, this is the time to act. Use the toll-free 800 number to find out more. (In Texas call 1-800-292-5106.) Call anytime, day or night, or send your resume with salary history to: Technical Recruiter, Datapoint Corporation, 9725 Datapoint Dr., MS G-05-050 San Antonio, Texas 78284. We are an equal opportunity employer.

1-800-531-5770



DATAPOINT
We sparked the revolution.

SYSTEM SENIOR ANALYST

A leading manufacturer located east of Pittsburgh, PA, at its corporate headquarters is seeking an individual with strong systems management skills to direct a staff of Systems Analysts and Programmers in the design, development, implementation and maintenance of business and manufacturing systems within our MIS department.

The successful applicant will plan, organize and formulate systems development strategies, maintain an effective project support system and provide staff counseling.

The ideal candidate will also possess effective systems and managerial ability with a minimum of 7 years MIS experience in applications and development with at least 3 years in a supervisory capacity. A BS degree preferred in Computer Science is required. We offer a competitive salary, full range of benefits and an opportunity to develop your professional skills.

Please forward resume including salary history in confidence to:

Box CW-B4318
Computerworld
Box 880
Framingham, MA 01701

DATA PROCESSING
S.E. BANKING CAREERS

PROGRAMMER ANALYST TO: \$30,000 2-5 yrs banking exp., prefer CD, sys. experience and knowledge of Florida software packages.

PROGRAMMER ANALYST TO: \$30,000 2-5 yrs exp. Prefer fixed assets/accounts payable knowledge. Will involve heavy user interface.

PROGRAMMER ANALYST TO: \$30,000 CPCS - COBOL/ASSEMBLER. Requires good communication skills plus ability to work with user groups.

PROGRAMMER ANALYST TO: \$30,000 3600 experience. CICS, MACRO. Will also require extensive user interface.

SYSTEMS PROGRAMMER TO: \$35,000 Minimum 2 yrs exp. Coordination of capacity planning/performance tuning. Requires MVS/SP, AFC/VTAM, IMS, CMF, BEST/1 or Crystal. Must possess good written and oral comm. skills.

All positions offer excellent career opp'tys, plus exceptional benefits and competitive salaries. For information of the above and other DP positions contact Larry Stone, at 704-375-0600 or send resume in confidence to:

FOX-MORRIS
Personnel Consultants
1350 The Johnston Bldg.
Charlotte, NC 28281

HOW TO MAKE OVER \$80,000.00 A YEAR
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Acquire one of the most demanded & rewarding programming skills in months instead of 2 years. A complete self-study book based on CICS latest version 1.5, written in COBOL and with special emphasis on VSAM. It covers virtually every CICS technique you will ever need. Fifteen sample programs address all CICS major applications. Over 150 ready-to-use examples. Sample programs include: Menu, Add, Update, Delete, Browse, Print 24x80, Print 66x132, Print Any Size Report, Message Routing, Screen Refreshing, VSAM Alternate Index Setup and Manipulation, Constant Table Setup and Use and more.

It is hard to believe the learning can be so easy until you try it. In hours, you can start to create your own BMS maps; in days, you can start to write your own pseudo conversational CICS programs. Some CICS techniques are especially hard. When you are stuck for the technical problems, you'll be thankful you have this book.

Moonlighting on CICS projects is very rewarding. A typical 10-screen system can mean \$15,000 cold cash. This book also tells you how to market your services, locate the contracts, write a proposal, make a presentation, quote the right price & draw a contract agreement without a lawyer.

But act now. Send \$34.95 (plus \$2.00 for shp. & hndl.) or \$32. ea. for 2, \$30 ea. for 3, \$28. ea. for 4 and over. (shp. & hndl. incl.) in Check or money order to: CCD ONLINE SYSTEMS, INC., P.O. BOX 795759, DALLAS, TX 75379. Allow 1 to 2 weeks for delivery. Full refund within 10 days if not satisfied.

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JOIN A LEADER

INFORMATION SYSTEMS SOFTWARE

In fifteen years Boole & Babbage has become a world leader in the development of both software products and educational and consulting services designed to facilitate, plan for, and optimize the management of large IBM and compatible computer systems.

Corporate growth worldwide has been impressive. And we are now searching for experienced people committed to excellence in this field who would like to join Boole & Babbage's sales organization in the Chicago, Atlanta and St. Louis areas.

SALES REPRESENTATIVES

The ideal candidate possesses a minimum of three years sales experience, preferably in systems software, with proven ability and a record of

successes. A college degree is preferred.

The position has a six-figure earning potential as well as excellent growth and management prospects.

SYSTEMS ENGINEERS

The ideal candidate possesses a minimum of five years experience in large IBM mainframe, MVS/VM software. Superior "people" skills are a necessity.

The position involves pre- and post-sales support, customer education, and limited travel. Earnings will be in the mid-forties.

Boole & Babbage offers an outstanding benefits package. If you are committed to MVS and IMS systems, we would like to hear from you.

For either position, resumes should be sent to Personnel Director, c/o Boole & Babbage, Inc., 2115 Butterfield Road, Suite 102, Oakbrook, IL 60521.

Boole & Babbage

Information Resource Management
Tools : Education : Experience

COMMUNICATIONS SOFTWARE SPECIALIST

A large Midwestern manufacturing firm seeks an experienced Communications Software Specialist to plan, configure and administer a company-wide telecommunications network. Responsibilities will include network topology design and network control software maintenance. The network serves a multi-mainframe, multi-vendor, multi-protocol environment. Future plans include the incorporation of Personal Computers and local area networks into the company data processing system.

Required qualifications include proficiency in IBM System/370 assembler language, 2 to 3 years experience in CICS/VS maintenance and CICS/VS internals, 2 to 3 years experience in software maintenance of a telecommunications control unit (IBM 3705, Comten, CC-80, etc.).

Preference will be given to candidates with Bachelor's Degree in Computer Science, Engineering, or other hard science; experience with VM/CMS, DOS/VSE, and OS/MVS systems; written communication skills, including the ability to prepare publication quality technical documentation.

This position offers the opportunity for career development and excellent salary and company-paid benefits. Please forward resume and salary requirements to:

CW-B4312
Computerworld
Box 880
Framingham, MA 01701
An Equal Opportunity Employer

SCIENTIFIC PROGRAMMER

Midwest company has a position available for an individual to define and develop functional specifications for electric utility energy management systems. The person selected will be responsible for the design, implementation, and test of the systems, as well as, the co-ordination of integration and factory acceptance tests, field installation and availability tests. Position requires a degree in one of the physical sciences and 6 years of experience in Real Time Network Communications Systems and Real Time Electric Utility Energy Management Systems. Experience on CYBER 170 and CYBER 18-50 processors with a good systems knowledge of NOS/BE and MSOS is necessary with a strong background in ASSEMBLY and FORTRAN languages. Salary to \$3150/month. Hours are 8 am to 5 pm with a 40 hour week. Interested applicants should send resume to:

Nancy Thompson
M.D.E.S.
309 Second Ave., South
Minneapolis, MN 55401
An affirmative action employer
Control #3-81

UNIVERSITY OF MINNESOTA

Four year liberal arts campus located 150 mi. west of Mpls-St. Paul at edge of MN famous lake region seeks Ph.D. or ABD in Computer Science or closely related area to teach upper/lower division C.Sci. courses. Requires strong teaching research interest. Person expected to develop and teach upper div. Opr. Syst., Compiler, Automata, Architecture. UMM is recipient of Title III grant from U.S. Dept. of Ed. to develop these courses. DEC VAX-11/750 (VMS), PDP-11/44 (UNIX), Access to CDC CYBER's 170, CRAY 1 and IBM 4341. Assistant Prof for Ph.D. tenure-track. Salary negotiable. Excellent fringe. Start Jan 2 or Sept 16, 1984. Send resume, transcripts, and 3 letters of reference by Nov 28 for Jan 2 start date to Dr. James Olson, Chairman, Division of Science and Math, Rm 217E, University of Minnesota, Morris, Morris, MN 56267. The University of Minnesota, Morris is an equal opportunity educator and employer and specifically invites and encourages applications from women and minorities.

We are currently recruiting for:

**PROGRAMMERS, P/A, S/P, S/A,
DBA's**

If we have not called you yet:

(1) We do not know who you are:
(2) Or no one has recommended you yet

If you have one year of experience or more and want to work in N.C., S.C., VA, TN or GA call one of our D.P. Recruiters collect:

Chip Groome, CPC; Diane Amos, CPC; Jane Green; Brenda Carey

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Our client companies pay all of your fees, interview and relocation expenses.

SYSTEMS/ PROGRAMMER

If you're looking for an exciting career, Rocky Mountain Energy, the Denver-based, natural resources subsidiary of Union Pacific Corporation, offers the following:

- In-depth exposure to MVS/SP internals, CICS, micro-terminal networking, VTAM, VSAM, TSO/SPF, distributed processing to remote HP 3000
- Implement state-of-the-art software
- Challenging professional environment
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- Excellent benefits including dental and thrift plans
- Recreational opportunities of the Rocky Mountains
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Salary is competitive and commensurate with your academic training, work experience, and ability to contribute. For confidential consideration, send your resume TODAY to:

Daniel L. Schaeffer
Manager-Employee Selection & Development
Rocky Mountain Energy
10 Longs Peak Drive
Box 2000
Broomfield, Colorado 80020
Rocky Mountain Energy

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NATIONAL BUREAU OF STANDARDS INSTITUTE FOR COMPUTER SCIENCES AND TECHNOLOGY OPPORTUNITIES FOR CHALLENGING POSITIONS IN COMPUTER SCIENCE AND TECHNOLOGY

Computer Scientists/Electrical Engineers

The System Components Division of the Institute for Computer Sciences and Technology at the National Bureau of Standards is seeking GS-12, 13, 14, and 15 Computer Scientists and Electrical Engineers to perform research and advanced development on multiprocessing computer systems, speech recognition, data encryption for computer security, and optical digital data disk/high density magnetic recording. Successful applicants must possess an in-depth knowledge and familiarity with one or more of the following technological areas:

MULTIPROCESSING COMPUTER SYSTEMS

Theoretical and applied computer science and technology with emphasis on computer architecture, multiprocessing systems, or parallel processing.

SPEECH RECOGNITION

Theoretical and applied pattern recognition technology with emphasis on acoustics, phonetics, and artificial intelligence algorithms and languages.

DATA ENCRYPTION FOR COMPUTER SECURITY

Theoretical and applied computer science, data communications, mathematics, cryptographic algorithms, and computer security analysis problem definition.

OPTICAL DIGITAL DATA DISK/HIGH DENSITY MAGNETIC RECORDING

Theoretical and applied optical and magnetic technology with emphasis on computer mass storage, system architecture, or dynamic test and measurement techniques.

These positions range from the GS-12 to GS-15 grade levels depending upon qualifications and experience and offer competitive salary, excellent career benefits and professional growth opportunities. Please send your Personal Qualifications Statement (SF-171) to:

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SYSTEMS PROGRAMMERS/ ANALYSTS PACIFIC NORTHWEST

The Corvallis, Oregon office of CH2M HILL, an employee-owned, multi-discipline consulting engineering firm with offices throughout North America and overseas, has career opportunities for Systems Programmers/Analysts.

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BS in Computer Science or equivalent curriculum required. At least 3 years experience programming in a OS/CICS/COBOL environment plus 4 years experience designing administrative systems such as finance, accts, payroll or personnel. This experience should be on one of the major database systems such as ADABAS, IMS, or IDMS.

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EE degree preferred or equivalent in college, military or vocational training. Minimum of 5 years experience in minicomputer systems and peripherals. Experience on Cambex, Magnuson or Formation desired. Will handle preventive maintenance, repairs, modifications and installation of computer-systems and peripherals, modems, multiplexors, facsimiles, switch gears and UPS systems.

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Brown-Forman, a consumer products company and one of the world's largest producers and marketers of distilled spirits and wines, is currently seeking a highly motivated Management Information Systems (MIS) Professional. This important position is responsible for the hands-on design, development, implementation, and maintenance of comprehensive (EDP) Management Information Systems for the International Division of the company.

The qualified candidate will possess a BS in Computer Sciences, Business Math or Engineering, and at least 5 years of business systems analysis experience. Experience in automated financial applications, preferably with micro computers, is essential. We prefer demonstrated skills in initiating and executing projects, and the ability to implement tasks independently. An MBA in Finance or Accounting is highly desirable.

We offer an excellent salary and benefits package and opportunities for the future. For prompt consideration, please send your resume with salary history to:

Linda LeBlanc
Manager of Staffing



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3000 L Street
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EOE M/F/H

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Kaiser Electroprecision, a Kaiser Aerospace and Electronics Company, has an excellent opportunity for an experienced Senior Systems Programmer Analyst.

The position requires a sharp individual having experience with HP 3000, COBOL II, FORTRAN and Manman Installation.

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Kaiser Electroprecision
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Irvine, CA 92714
Or Call (714) 540-6810 Ext. 215
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Eastern is a leader in airline computer technology having 3 IBM 9083's and 5 IBM 3033's. Our real time network serves approximately 20,000 online terminals. We offer excellent short term career growth opportunity, company paid dental, medical, life and retirement insurance, relocation reimbursement and outstanding worldwide travel discounts. Living in Florida offers a sun filled casual outdoor lifestyle with no state income tax.

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Management Recruiting
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Desirable experiences includes systems programming with current VAX/VMS and UNIX operating systems. An undergraduate degree which consisted of 30 semester hours in mathematics, statistics and computer science and included differential and integral calculus courses is required in addition to at least 3 years of experience in the computer science field.

This position is either GS-12 or GS-13 grade level, depending upon qualifications and experience. It offers competitive salary, excellent career benefits and professional growth opportunities. Please send your Personal Qualifications Statement (SF-171) to:

U.S. Department of Commerce
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Administration Building, Room A-123
Washington, D.C. 20234
Attn: Ms. Josephine White (CW)

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Systems Engineer to design and develop software to build laser trimming equipment for the manufacture of hybrid circuits; will utilize software development languages such as Motorola 68000 Assembly language and "C" programming language; will utilize knowledge of Analog and Digital electronics as well as electronic measurements to design software to control electronic measurements related to laser trimming; software will be designed for multitasking operating systems as well as compiler construction. PDP-11/23 computer will be used for software development. Bachelor of Technology or equivalent in Electrical Engineering required as well as 1 1/2 years experience as Systems Engineer or 1 1/2 years experience as a Field Service Engineer for microprocessor development systems and electronic measurement systems. 40 hours, 9 to 5, \$30,000. per year. Resumes required. Please contact Mr. Joseph Milani, President, Chicago Laser Systems, Inc., 4034 North Nashville, Chicago, IL 60634.

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Academic year position starting Spring 1984. Salary based on education and experience; excellent fringe benefits.

Qualifications Desired: Bachelor's degree with course work in data processing/computer science. Previous teaching experience plus practical work experience in a data processing/computer science environment.

Responsibilities: Teach data processing, from the introductory course through some of the higher level languages, instructing on micro computers and mainframe. Work with data processing advisory committee, develop and evaluate curricula.

Applications Requirements: Completed application form, copies of transcripts, resume and three letters of recommendation or placement test.

Closing Date: November 28, 1983.
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SYSTEMS ANALYST/ PROGRAMMERS

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We offer an above-average salary, commensurate with experience. Our Benefits Package includes Major-Medical, Hospitalization, Dental, Optical & Life Insurance, Retirement Plan, Paid Relocation, and much more.



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We are a north suburban marketing firm, leader in our industry and a profitable division of a Fortune 100 company. We are searching for a Project Manager to lead the development of new Marketing and Operating systems. Creativity and strong management and technical expertise are essential.

The ideal candidate will have 7-10 years experience in systems development including several years management responsibilities with strong familiarity with TSO, CICS and DL1. BA/BS required; advance degree a plus. Our state-of-the-art environment includes IBM 3081 and 3033 hardware with OS/MVS, JES 3 operating systems.

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SYSTEMS PROGRAMMER

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PROGRAMMER ANALYSTS

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If you are a Programmer/Analyst with Hogan Umbrella experience, our dynamic career environment can deliver for you as well. We are seeking a number of experienced Programmer/Analysts to join our development teams as they embark on an aggressive propagation schedule. Duties are the reading of PEM dumps, working with PEM utilities, trace problems, and installation of new releases.

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EOE/Affirmative Action/M/F

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Attach a current resume (if available) and mail in complete confidence to: LeEtta Flicker
Norwest Information Services, Inc.
255 Second Avenue South
Minneapolis, MN 55479.



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SCIENTIFIC PROGRAMMER

Midwest company has a position available for an individual to define and develop functional specifications for electric utility energy management systems. The person selected will be responsible for the design, implementation, and test of the systems, as well as, the co-ordination of integration and factory acceptance tests, field installation and availability tests. Position requires a degree in one of the physical sciences and 6 years of experience in Real Time Network Communications Systems and Real Time Electric Utility Energy Management Systems. Experience on CYBER 170 and CYBER 18-50 processors with a good systems knowledge of NOS/BE and MSOS is necessary with a strong background in ASSEMBLY and FORTRAN languages. Salary to \$2840/month. Hours are 8 am to 5 pm with a 40 hour week. Interested applicants should send resume to:

Nancy Thompson
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309 Second Ave., South
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Diversified national retail corporation based in the Washington, DC suburbs needs a seasoned DP Manager with 7-10 years actual management experience for our expanding DP department. Position responsibilities include new systems development, programming and operations.

The qualified candidate will have a good technical background with on-line and telecommunication experience as well as extensive financial application and distributive processing exposure.

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Carol Stuart, DP Specialist
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We'll provide an excellent salary and benefits package. Please forward a resume and salary history in confidence to:

Personnel Department, OAKWOOD HOSPITAL, 18101 Oakwood Blvd., Dearborn, MI 48124

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Oakwood Hospital

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Los Angeles based high-technology firm is seeking an experienced Systems Analyst with solid background in stock market applications, including options and commodities.

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Excellent opportunity to be an individual contributor in a high-growth company. Benefits include company paid medical/dental/life/vision insurance for employees and dependents, and educational assistance.

CW-B4317

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609-596-2244

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We are seeking a self motivated programmer to join our progressive organization, located in downtown Washington, D.C. We offer a wide range of challenging assignments, comfortable work environment, competitive fringe benefits, and realistic possibilities for future advancement.

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Qualified candidates (principals only) are encouraged to send complete resume or letter outlining qualifications, including indication of current salary to address below:

Madison National Bank
Personnel Department
1730 M Street N.W.
Washington, D.C. 20036
EOE/MF

Director of Computer Center

Coker College is seeking applicants for the position of Director of the Computer Center to teach computer courses, work with the administration in developing applications for IBM System/34, and direct the operations of the College's Computer Center. This position requires considerable experience in computer operations and at least a Master's degree. Candidates must be familiar with COBOL and Database Management. Salary commensurate with education and experience. Coker College is a small, four year college located two blocks from the headquarters of a Fortune 500 company and within 90 minutes of both the beach and the mountains. Send resume by December 15 to: Dr. Malcolm C. Doubles, Dean of the College, Hartsville, South Carolina 29550. EOE.

SCIENTIFIC PROGRAMMER

Midwest company has a position available for an individual to define and develop functional specifications for electric utility energy management systems. The person selected will be responsible for the design, implementation, and test of the systems, as well as, the co-ordination of integration and factory acceptance tests, field installation and availability tests. Position requires a degree in one of the physical sciences and 6 years of experience in Real Time Network Communications Systems and Real Time Electric Utility Energy Management Systems. Experience on CYBER 170 and CYBER 18-50 processors with a good systems knowledge of NOS/BE and MSOS is necessary with a strong background in ASSEMBLY and FORTRAN languages. Salary to \$3289/month. Hours are 8 am to 5 pm with a 40 hour week. Interested applicants should send resume to:

Nancy Thompson
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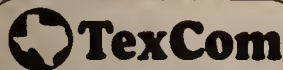
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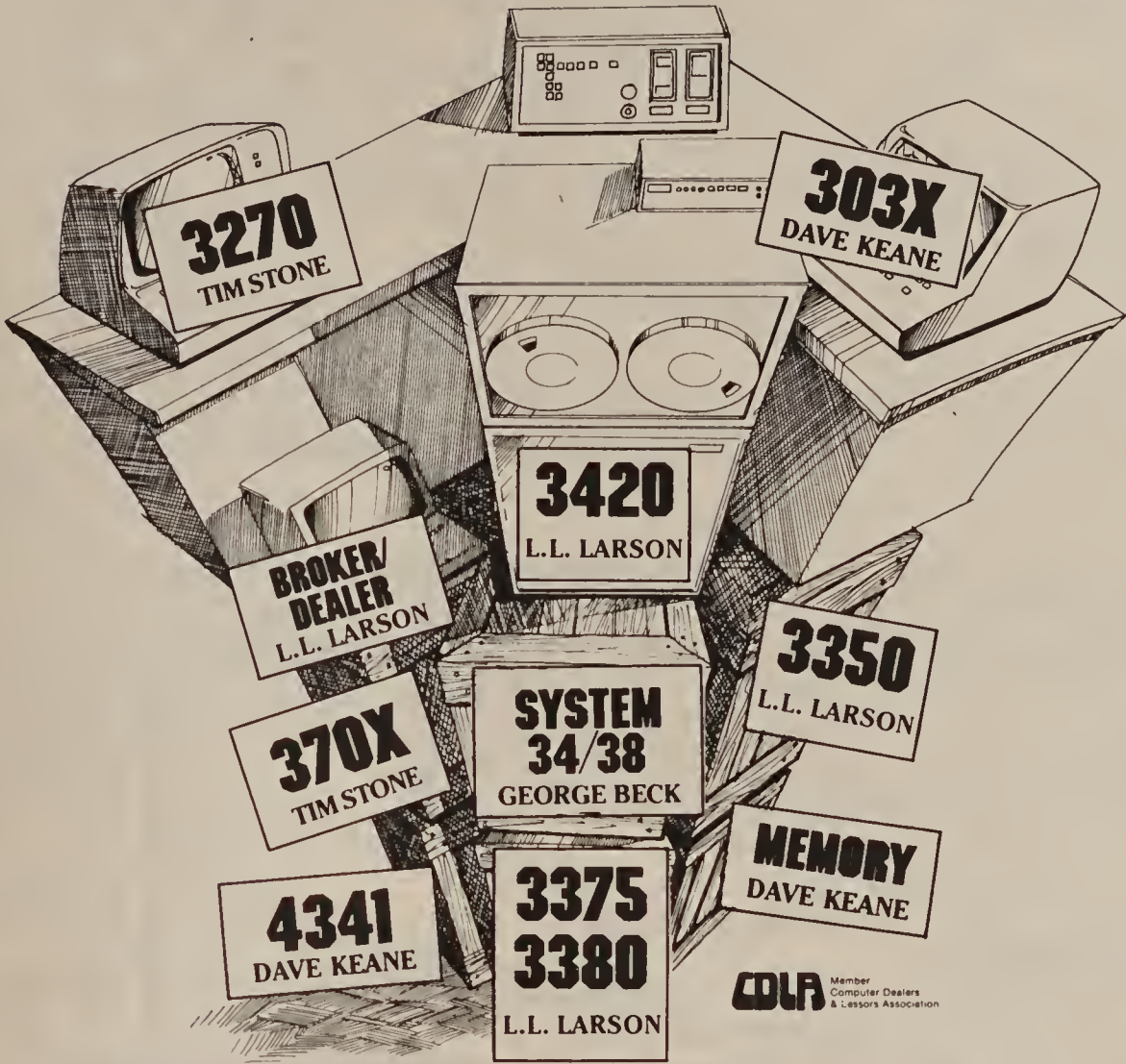


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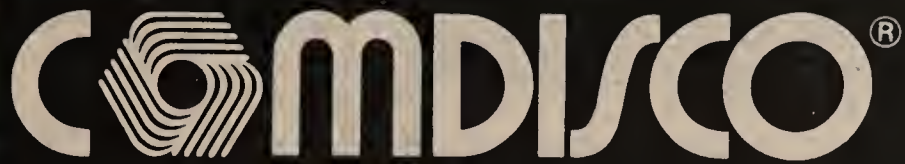
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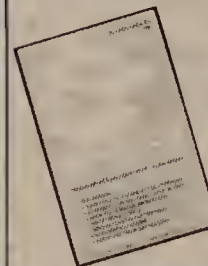
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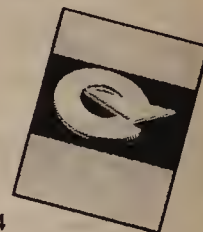
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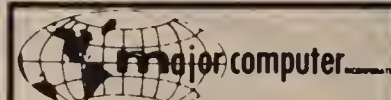
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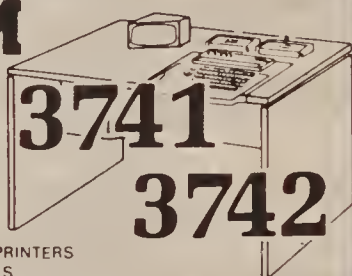
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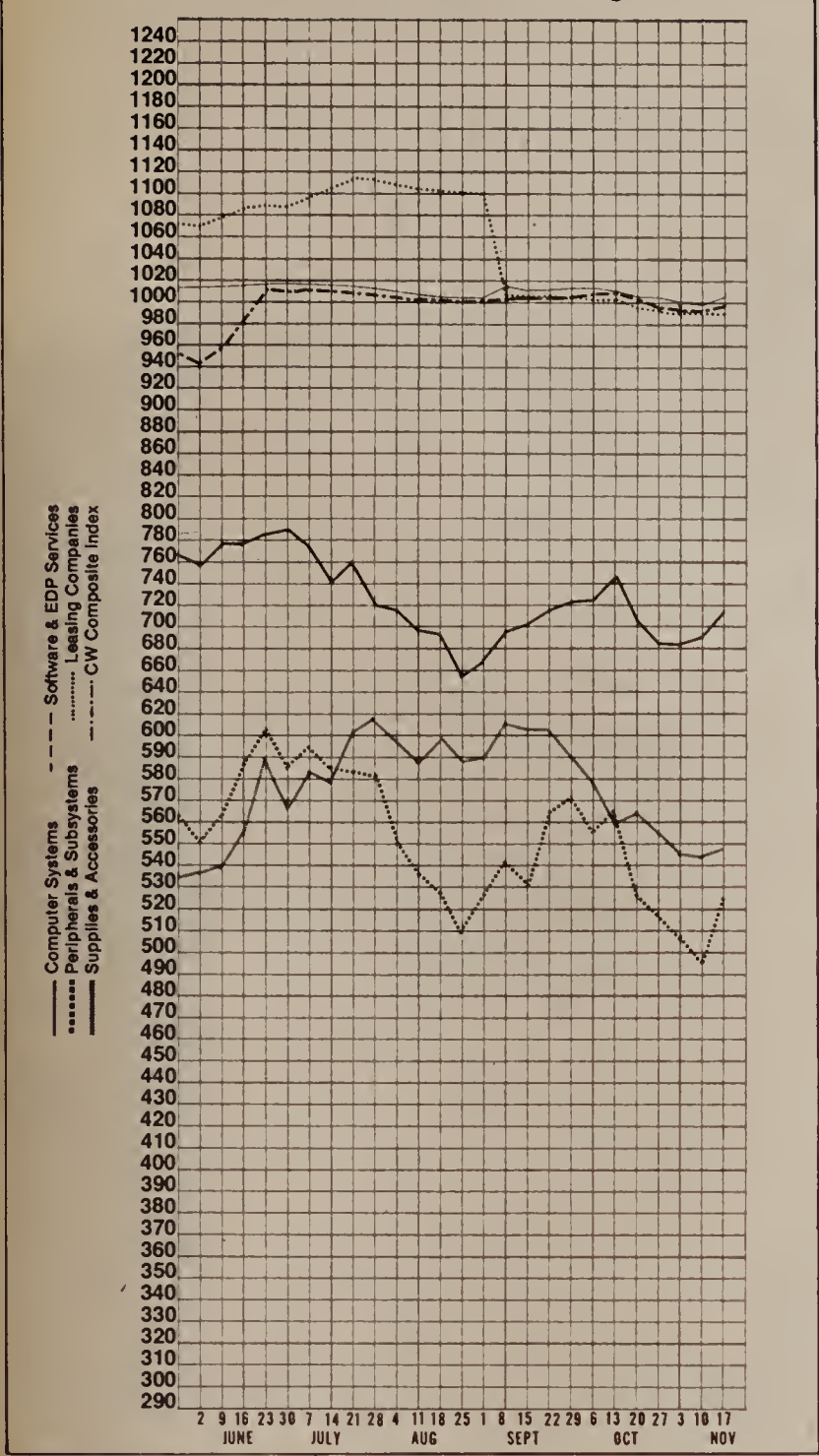
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PRICE						PRICE						PRICE					
X	1982-83	CLOSE	WEEK	WEEK		X	1982-83	CLOSE	WEEK	WEEK		X	1982-83	CLOSE	WEEK	WEEK	
C	RANGE	NOV 16	NET	PCT		C	RANGE	NOV 16	NET	PCT		C	RANGE	NOV 16	NET	PCT	
H	(1)	1983	CHNGE	CHNGE		H	(1)	1983	CHNGE	CHNGE		H	(1)	1983	CHNGE	CHNGE	
COMPUTER SYSTEMS																	
D	ALPHA MICROSYSTEMS	11-24	14 3/4	0	0.0	D	ADVANCED COMP TECH	1-8	3	0	0.0	D	COMPUTER DEVICES INC	1-21	1 1/8	+ 3/8	+50.0
D	ALTOS COMPUTER SYST	8-28	8 3/4	+1 1/4	+16.6	D	ADVANCED SYSTEMS INC	6-22	17	0	0.0	D	COMPUTER TRANSCIVER	4-12	4 7/8	0	0.0
A	AMDAHL CORP	9-30	19 3/4	+2 1/4	+12.8	D	AGS COMPUTERS INC	7-32	25 3/4	+1 1/4	+5.1	N	COMPUTERVISION CORP	19-53	42 7/8	+ 5/8	+1.4
D	APPLE COMPUTER INC	18-63	20	+ 3/4	+3.8	D	AMERICAN SOFTWARE	21-31	22 1/2	+ 3/4	+3.4	N	CONRAC CORP	17-38	16 3/4	- 1/2	-2.8
N	AT&T	60-70	63 1/8	- 7/8	-1.3	N	ANACOMP INC	6-23	6 7/8	+1	+17.0	A	DATAPRODUCTS CORP	16-41	28 7/8	+1 1/2	+5.4
N	BURROUGHS CORP	28-58	48 1/8	+ 1/4	+0.5	D	ANALYSTS INTL CORP	5-20	15 3/4	+ 3/4	+5.0	A	DATARAM CORP	5-12	11 1/8	+1 1/8	+11.2
D	COMPUTER AUTOMATION	6-17	6 3/4	+ 3/8	+5.8	A	APPLIED DATA RES.	8-37	30 3/4	+1 3/4	+6.0	D	DATA SWITCH CORP	13-41	29 1/2	+4	+15.6
A	COMPUTER CONSOLES	8-26	19 5/8	+1 1/2	+8.2	D	ASK COMPUTER SYSTEMS	6-21	17 1/2	0	0.0	D	DATUM INC	2-17	10	+ 3/8	+3.8
N	CONTROL DATA CORP	21-62	45 7/8	-1	-2.1	B	ASTRADYNE COMP IND	1-7	2 3/4	+ 1/8	+4.7	D	DECISION DATA COMPUT	3-16	11 3/4	+ 7/8	+8.0
D	CONVERGENT TECHNOL	18-41	23 3/8	+1 3/8	+6.2	N	AUTOMATIC DATA PROC	21-44	34 5/8	- 3/4	-2.1	D	DECUTEL-OLIVETTI	11-39	12 1/2	+1 1/2	+13.6
N	CRAY RESEARCH INC	20-54	52 5/8	+1 3/4	+3.4	D	CGA COMPUTER ASSOC	5-17	13 1/4	- 1/2	-3.6	N	ELECTRONIC M & M	5-11	7 1/8	+ 1/8	+1.7
N	DATA GENERAL CORP	20-82	72 3/4	-1 1/4	-1.6	D	COMPUTER ASSOC INT'L	6-35	25 1/2	- 1/4	-0.9	D	EVANS & SUTHERLAND	18-50	35 3/4	+3 1/4	+10.0
N	DATAPoint CORP	11-36	28	+3	+12.0	D	COMPUTER HORIZONS	8-20	12	+1 3/4	+17.0	D	GANDALF TECHNOLOGIES	8-22	8 1/4	+ 1/4	+2.7
N	DIGITAL EQUIPMENT	62-132	88 1/4	0	0.0	D	COMPUTER NETWORK	4-10	6	- 1/8	-2.0	N	GEN'L DATA COMM IND	6-28	27 1/2	+3	+12.2
A	EEDC INC	6-16	14 1/8	0	0.0	N	COMPUTER SCIENCES	11-23	17 1/4	+ 7/8	+5.3	D	GREAT SOUTHWEST IND	1-6	1	- 1/4	-20.0
N	ELECTRONIC ASSOC.	5-15	6 3/4	+ 5/8	+10.2	D	COMPUTER TASK GROUP	8-22	14 1/2	+ 3/4	+5.4	N	HAZELTINE CORP	7-31	23 7/8	+3 1/2	+17.1
N	FLOATING POINT SYST	16-44	32 3/4	+1	+3.1	D	COMPUTER USAGE	2-22	13 1/2	- 3/4	-5.2	D	ICOT CORP	3-10	4	+ 3/8	+10.3
N	FOXBORO	22-47	33 3/4	+1 3/8	+4.2	D	COMPUTONE SYSTEMS	5-38	6 1/2	+1 1/4	+23.8	D	INFORMATION INTL INC	10-22	14 1/2	+1 1/4	+9.4
D	GENERAL AUTOMATION	3-16	11 1/2	+2 1/4	+24.3	D	COMSERV CORP	5-20	5 1/4	- 1/2	-8.8	D	INTEL CORP	11-45	41 3/4	+4 1/4	+11.3
N	GOULD INC	26-44	30 1/2	+1 3/8	+4.7	D	COMSHARE	7-13	10 7/8	+ 1/8	+1.1	D	IPL SYSTEMS INC	5-14	5 3/4	+ 1/4	+4.5
N	HARRIS CORP	20-51	38	+1 1/4	+3.4	N	CULLINET SOFTWARE	12-50	41 1/2	+5 1/4	+14.4	A	LUNDY ELECTRONICS	7-19	12 1/8	+1 1/4	+11.4
N	HEWLETT-PACKARD CO	22-48	39 5/8	+2 7/8	+7.8	D	CYCARE SYSTEMS INC	8-27	17 1/2	+ 1/4	+1.4	D	MEADADATA CORP	9-15	11 1/2	+ 3/4	+6.9
N	HONEYWELL INC	60-132	130 1/8	+4 1/8	+3.2	N	ELECTRONIC DATA SYST	10-42	40 1/4	+3 1/2	+9.5	A	MSI DATA CORP	16-37	21 1/4	+1 1/4	+6.2
N	IBM	57-134	124 3/4	+1 1/8	+0.9	D	HOGAN SYSTEM INC	27-53	39 1/4	+1 1/2	+3.9	N	NASHUA CORP	9-29	24 1/2	+1 1/4	+5.3
D	IPL SYSTEMS INC	5-14	5 3/4	+ 1/4	+4.5	N	GENERAL ELECTRIC CO	45-58	55 1/8	+ 7/8	+1.6	D	NETWORK SYSTEMS CORP	8-34	23 1/2	+3 5/8	+18.2
N	M/A-COM INC	21-35	24 7/8	+2 3/8	+10.5	N	GTE CORP	39-48	45 3/4	- 7/8	-1.8	N	NO AMERICAN PHILIPS	47-79	76 7/8	+1 3/8	+1.6
D	MAGNUSON COMP SYSTS	2-5	3/8	0	0.0	D	INFORMATICS INC	10-34	23 1/4	+2	+9.4	N	NORTHERN TELECOM LTD	22-49	42 1/4	+2	+4.9
N	MANAGEMENT ASSIST	7-19	17 3/8	- 5/8	-3.4	D	INFOTRON SYSTEMS COR	25-43	35 1/2	+2 1/2	+7.5	D	OMEX	3-6	3 3/4	- 1/4	-6.2
N	MATSUSHITA ELEC(ADR)	47-77	74 5/8	+2 5/8	+3.6	D	KEANE ASSOCIATES	4-15	7 1/4	- 1/2	-6.4	N	PARADYNE CORP	14-30	16 5/8	+1	+6.3
N	MODULAR COMPUTER SYS	6-16	8	- 1/8	-1.5	A	LOGICON	8-31	29	+2	+7.4	D	PENRIL CORP	7-14	10	0	0.0
N	MOHAWK DATA SCI	10-19	13 3/4	+ 3/8	+2.8	D	MCI COMMUNICATIONS	13-34	14 3/8	+ 1/8	+0.8	D	PHOENIX AMERICAN INC	7-17	11 3/4	+1 1/4	+11.8
N	MOTOROLA INC	82-148	140 7/8	+6	+4.4	D	MNGT SCI AMER INC	8-33	31 3/4	+3 3/4	+13.3	N	PLESSEY CO (ADR)	26-41	32 1/2	+ 1/2	+1.5
N	NAT'L SEMICONDUCTOR	22-60	51 3/4	+ 3/4	+1.4	D	MATHEMATICAL APP GRP	10-22	10	-2 1/2	-20.0	D	PRINTRONIX INC	23-34	29 1/4	+4 1/4	+17.0
N	NEC	39-135	132 3/4	+4 1/4	+3.3	D	MICOM SYSTEMS INC	25-50	44 1/4	+3 1/4	+7.9	N	RANTEK CORP	9-26	12	+2 3/4	+29.7
N	PERKIN-ELMER	17-37	27 7/8	- 3/4	-2.6	D	MONCHIK-WEBER CP	8-22	10 1/2	+2	+23.5	N	RAYTHEON CO	42-58	44 7/8	+1	+2.2
N	PRIME COMPUTER INC	11-30	14 5/8	- 3/4	-4.8	D	NATIONAL DATA CORP	5-26	20 1/8	+1 3/8	+7.3	N	RECOGNITION EQUIP	4-17	15 1/8	+ 3/8	+2.5
N	SPERRY CORP	21-47	44 1/2	+1 1/4	+2.8	D	ON-LINE SOFTWARE INT	17-27	20	+3	+17.6	N	ROLM CORP	40-80	59 3/4	+4 1/4	+7.6
D	TANDEM COMPUTERS INC	14-38	34 1/8	+1 3/4	+5.4	D	PANSOPHIC SYSTEMS	8-30	21	+1 3/4	+9.0	N	SANDERS ASSOCIATES	52-120	55 1/4	+1 1/2	+2.7
N	TANDY CORP	34-65	38 1/4	+2 1/4	+6.2	N	PLANNING RESEARCH	6-21	16 3/8	+ 3/8	+2.3	D	SCAN DATA	1-3	5/8	0	0.0
D	TELEVIDEO SYSTEMS	14-41	17 3/8	+1 3/4	+11.1	D	POLICY MGMT SYSTS CP	15-35	30 1/2	+3 1/4	+11.9	D	SCAN-TRON CORP	12-16	13 3/4	0	0.0
N	TEXAS INSTRUMENTS	71-178	137	+10 5/8	+8.4	D	PROGRAMMING & SYS	1-8	5 1/2	+ 3/4	+15.7	N	SCIENTIFIC ATLANTA	15-23	15 1/8	0	0.0
D	VECTOR GRAPHICS INC	2-14	2 3/8	- 1/2	-17.3	D	REYNOLDS & REYNOLD	17-53	45 1/2	+1	+2.2	N	STORAGE TECHNOLOGY	15-33	14 5/8	-1 3/8	-8.5
A	WANG LABS "B"	13-42	34	- 1/4	-0.7	D	SEI CORP	11-34	25 3/4	+1 1/2	+6.1	D	SVKES DATATECHNICS	5-27	4 7/8	- 1/4	-4.8
A	WANG LABS "C"	11-42	34 1/2	- 1/8	-0.3	D	SHARED MEDICAL SYST	13-43	38 1/2	+3 7/8	+11.1	D	SYSTEMS & COMP TECH	26-39	28 1/4	+1 1/4	+4.6
N	XEROX CORP	35-50	46 1/2	0	0.0	D	SCIENTIFIC COMPUTERS	6-14	10 1/4	- 1/4	-2.3	A	T BAR INC	7-17	8 1/8	+ 1/8	+1.3
LEASING COMPANIES																	
D	BOOTH FINANCIAL CP	11-35	29 1/2	0	0.0	D	SOFTWARE AG	5-17	10 1/8	+ 3/8	+3.8	A	TAB PRODUCTS CO	8-30	21	0	0.0
N	COMDISCO INC	7-42	18 1/8	-3 3/4	-17.1	N	TYMSHARE INC	12-30	23 1/8	+2	+9.4	D	TANDON CORP	19-35	23	+3	+15.0
D	CONTINENTAL INFO SYS	3-16	9 3/4	+1	+11.4	N	URS CORP	5-18	13 1/2	+ 5/8	+4.8	A	TEC INC	6-12	6 3/8	- 1/4	-3.7
N	OPF INC	5-15	13 3/4	- 1/8	-0.9	N	WYLY CORP	7-17	10	+ 1/4	+2.5	N	TEKTRONIX INC	34-87	80 1/2	+2 3/4	+3.5
N	U.S. LEASING	18-47	36 1/8	+1 3/8	+3.9	PERIPHERALS & SUBSYSTEMS											
COMPONENTS																	
N	ADVANCED MICRO DEV	13-35	31 3/4	+2 1/4	+7.6	P	AM INTERNATIONAL	2-7	4 1/4	+	+1.4	N	AMERICAN BUS PRODS	11-34	29	- 3/4	-2.5
D	ADV'D SEMICONDUCTOR	12-34	34	+3 3/4	+12.3	A	ANDERSON JACOBSON	9-26	9 1/4	-1 1/4	-11.9	N	BARRY WRIGHT	13-33	33	+ 7/8	+2.7
N	ANALOG DEVICES INC	18-42	39 3/8	+3	+8.2	D	AUTO-TROL TECHNOLOGY	8-29	20 1/2	+1 7/8	+10.0	A	DUPLEX PRODUCTS INC	12-26	24 1/8	+ 1/8	+0.5
D	ANALOGIC CORP	20-27	23 1/4	+1 1/2	+8.8	D	BANCTEC INC	7-33	15 1/2	+ 1/4	+1.8	N	ENNIS BUS. FORMS	6-28	24 5/8	- 3/8	-1.5
N	APPLIED MAGNETICS CP	19-37	31 7/8	+5 5/8	+21.4	A	BEEHIVE INT'L	4-15	7 3/8	+ 1/4	+3.5	N	3M COMPANY	48-90	85 3/8	+ 1/4	+0.2
N	TERADYNE	14-39	37	+3	+8.8	A	BOLT, BERANEK & NEW	9-60	47 3/4	+1 1/4	+2.6	N	MOORE CORP LTD	26-31	34 1/2	+ 3/4	+1.7
SUPPLIES & ACCESSORIES																	
EXCH: N=NEW YORK; A=AMERICAN; P=PACIFIC; B=BOSTON;																	
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER																	
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